Disney · PIXAR

THE ART OF

Cars
2

By BEN QUEEN with Karen Paik

Foreword by John Lasseter

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THE ART OF Cars 2
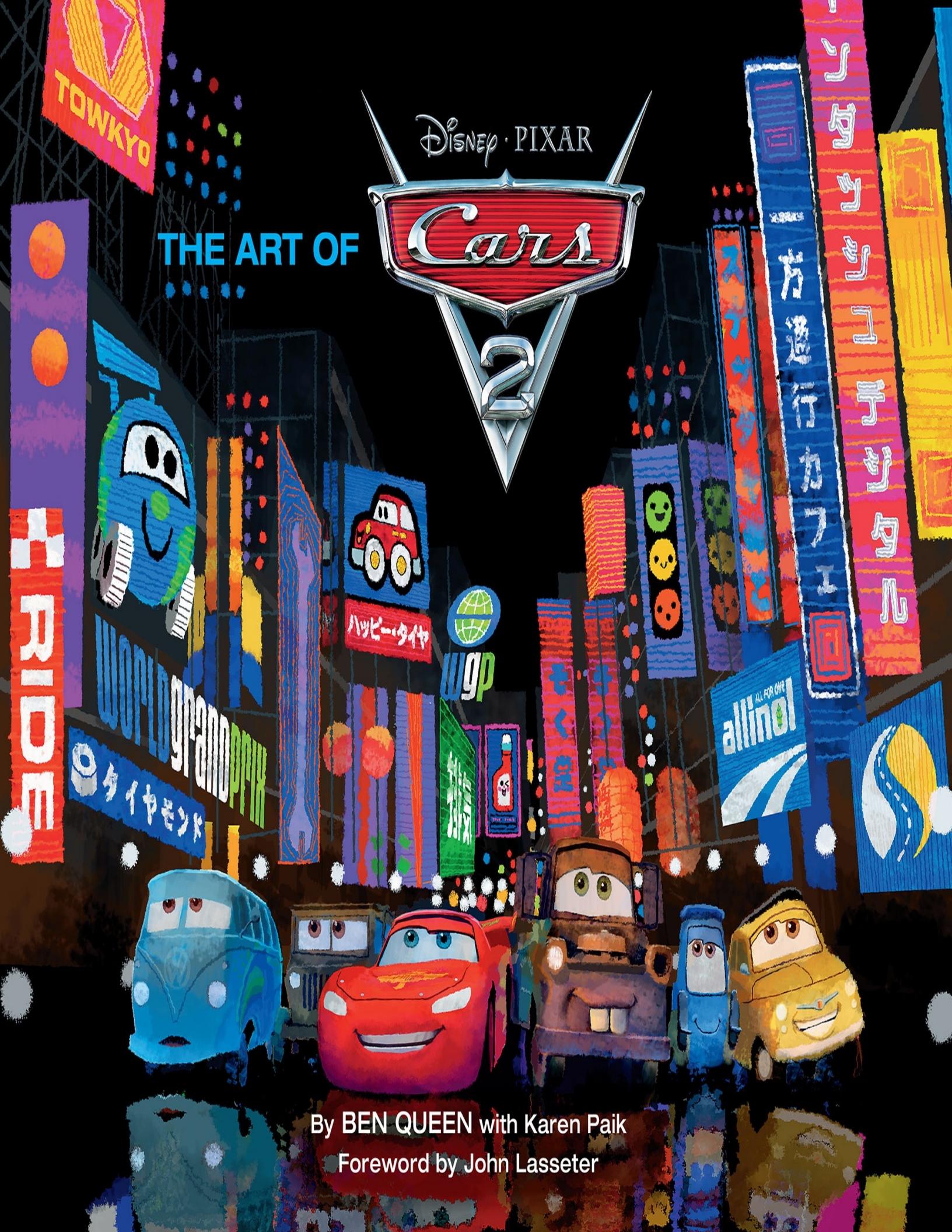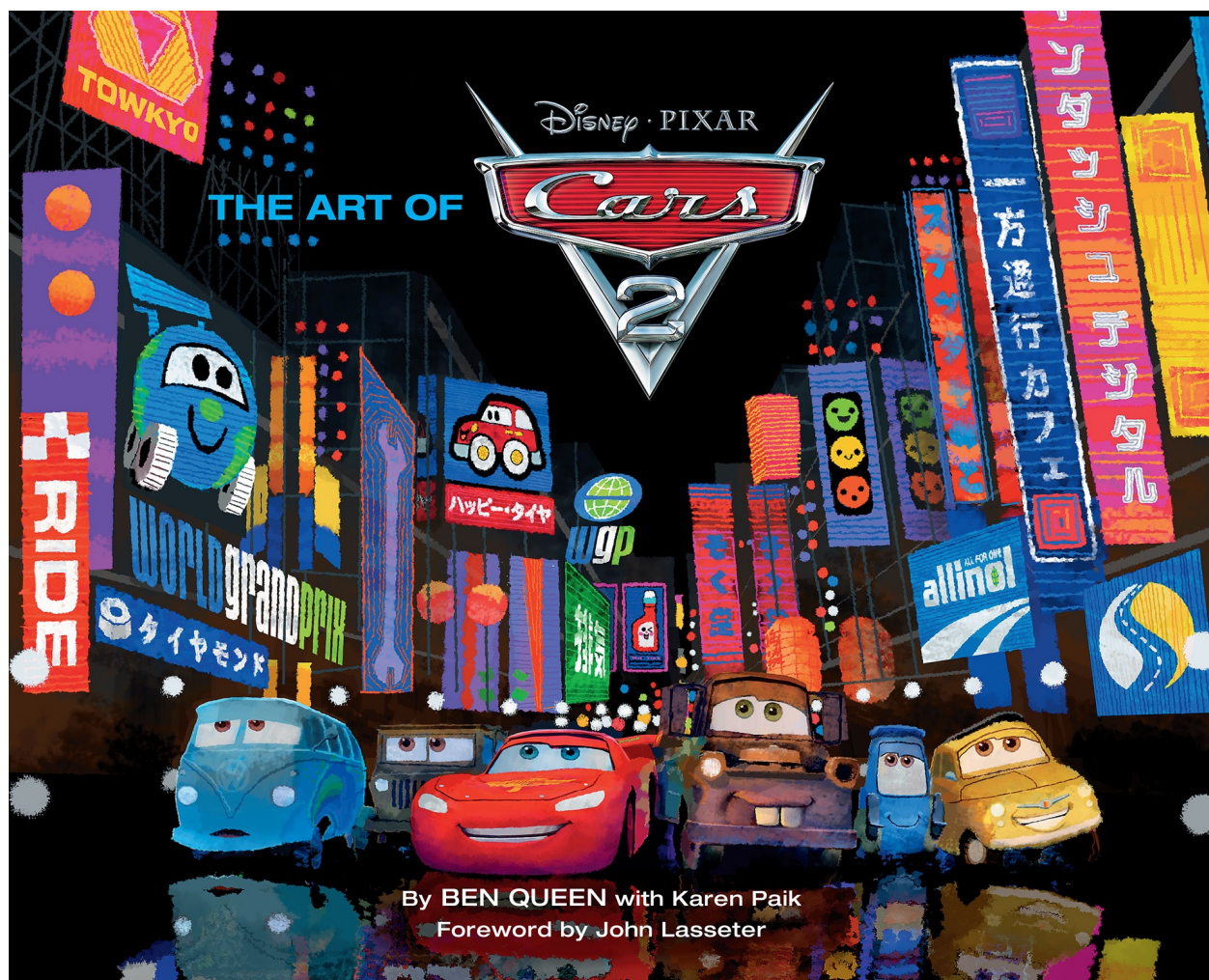
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Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

THE ART OF CARS 2

Front Cover: **Harley Jessup**, Digital, 2010.

Harley Jessup Digital, 2010.

TO THE AMAZING

CARS 2 CREW

JOHN LASSETER, DIRECTOR
DENISE REAM, PRODUCER

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Jack Chang, Digital paint over character render, 2010.

FOREWORD

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I believe there are three things you have to do to make a good film: you need to tell a compelling story with appealing characters set in a believable world. When you're making a sequel, the rules for two of those three, the characters and the world, are set for you; your main job is to tell a great new story. This challenge can't be under-estimated—coming up with the right story is the hardest thing about making movies. But for me, it's a special pleasure.

It takes four years to make one of our films. So much of us goes into them—our personal experiences, the things we find funny, the things we like and dislike . . . there's a little bit of everyone who helped create the story in the finished film. By the time we're done, I don't think of the characters and their world as creations anymore. I know them so well, they're more like friends, or colleagues, or family members.

So for me, making another film with characters I know and love is like getting to spend time with old friends. I get to find out more about them; have the fun of seeing them in totally different places; and see them change and do things I couldn't have guessed the first time around. Because, for us, the most important thing is to tell a great story, one that will entertain and surprise us as well as the audience—and, to do that

will entertain and surprise us as well as the audience—and, to do that, just as with any movie, we have to do something new; we have to go places we weren't expecting.

Lightning McQueen and Mater's adventures in this film just so happened to call for some of the most ambitious sets, environments, and characters we've ever done at Pixar. The crew on this film had a huge task in front of them, but they rose to the challenge and more. Seeing their inspiring work for this world was one of the biggest pleasures of making this film.

—John Lasseter

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.
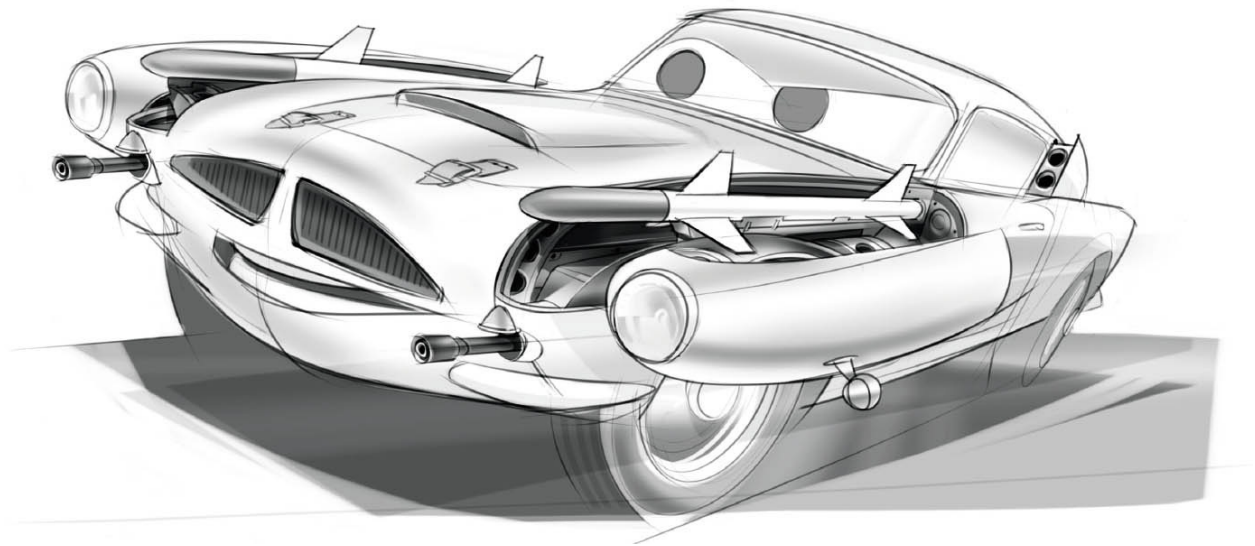

Armand Baltazar, Digital, 2010.

INTRODUCTION

Armand Baltazar, Digital, 2009.

Jay Shuster, Digital, 2009.

"We don't green light ideas, we green light directors who have a passion for an idea. It has nothing to do with whether it's an original or a sequel. What matters is that they have an idea they fall in love with. This is something we can make."

The prints for *Cars* had barely been struck in May 2006 when John Lasseter began to devise the idea for what would become his fifth feature film as director. Traveling around the world for the *Cars* publicity blitz, he had "vehicles as characters" on the brain: "I'm really into racing," says Lasseter. "Formula racing, rally, touring car, twenty-four-hour endurance racing—there are so many different kinds, and each one is so different from NASCAR. So this idea of an international race began percolating in my head, a race where Lightning McQueen would compete, and where we would get to see our characters in other countries."

Co-director Brad Lewis saw the potential immediately: "From America's standpoint, after *Cars*, Lightning McQueen's the best race car in the world. So the question was, 'Is he really?'"

"As we started developing this idea," Lasseter continues, "I thought about having the story become like an Alfred Hitchcock film, like *The Man Who Knew Too Much* or *North by Northwest*, where the innocent gets caught up in this spy world." The impetus for this idea—adding a spy-thriller element to the movie—originated even earlier in a discarded scene from the first film in which Sally and McQueen go on a date to a drive-in movie theater. Rob Gibbs (story artist on *Cars*) and the late Joe Ranft (head of story and co-director on *Cars*) created the "movie within a movie": a spy film with an ultracool car named Finn McMissile who dispatches bad-guy "Taxis of Death" with high-tech gadgetry and copious amounts of aplomb. "We just had fun designing this spy character," Lasseter says, "and we named him Finn McMissile, because, well, he's got missiles hidden all over him!"

Having found himself on the story-room floor in the first film, Finn McMissile was given a central role in *Cars 2*—this time not as an intertextual piece of background on a drive-in movie screen, but as a major character living and breathing in the *Cars* world.

Changing genres for a follow-up might be unusual in Hollywood, where sequel development seems to consist solely of repeating a formula over and over. At Pixar, though, genre shifting is the norm in the sequels they have tackled to date. Although tonally similar, *Toy Story* was a buddy film, *Toy Story 2* a rescue film, and *Toy Story 3* a prison break film. *Cars* was a mix of coming-of-age drama and slice-of-life comedy. It celebrated the values of community through the prism of small-town life off Route 66. *Cars 2*, although very comedic at its heart, is a fast-paced spy thriller.

Pixar's drive for originality, its desire not to repeat itself, would seem to be the primary factor in such widely divergent sequels. But there's also a more fundamental reason: "The most important thing in our movies is to find the underlying emotion," Lasseter says. "It's something you have to plan from the beginning. It's not something you can add later. That emotion comes from the growth of the main character. And deciding how that growth happens often determines what the genre of the film will be."

So who would provide the emotion and growth for *Cars 2*? To truly complete the "Hitchcockian innocent" formula, a true innocent was needed.

Storyboards, Cars, (origin of Finn McMissile character), **Rob Gibbs**, Colored Pencil/Ink, 2002.

**Kristian Norelius**, Pencil/Digital, 2010.

"WWMD?"

Lasseter, still on his creatively fertile *Cars* publicity tour, couldn't help but take in the experience as a fish out of water, a self-professed "bumpkin" in glamorous cities around the world. He started to feel a little bit like Mater, the rusty old tow truck who became the unlikely best friend to superstar race car Lightning McQueen in the first film. "I started looking at each country I was in, and I found myself giggling and laughing about how Mater would react to being in places that were so different from Radiator Springs."

Lasseter took in the confusing signage of the Tokyo overpasses, the intimidating ten-lane-wide roundabouts of Paris, the roads in Italy where it was explained to him that the traffic signals were mere suggestions ("something you might want to do"). In each situation, he just couldn't stop asking himself the same question over and over. It was a question that would become a mantra for the *Cars 2* creative team: "What Would Mater Do?"
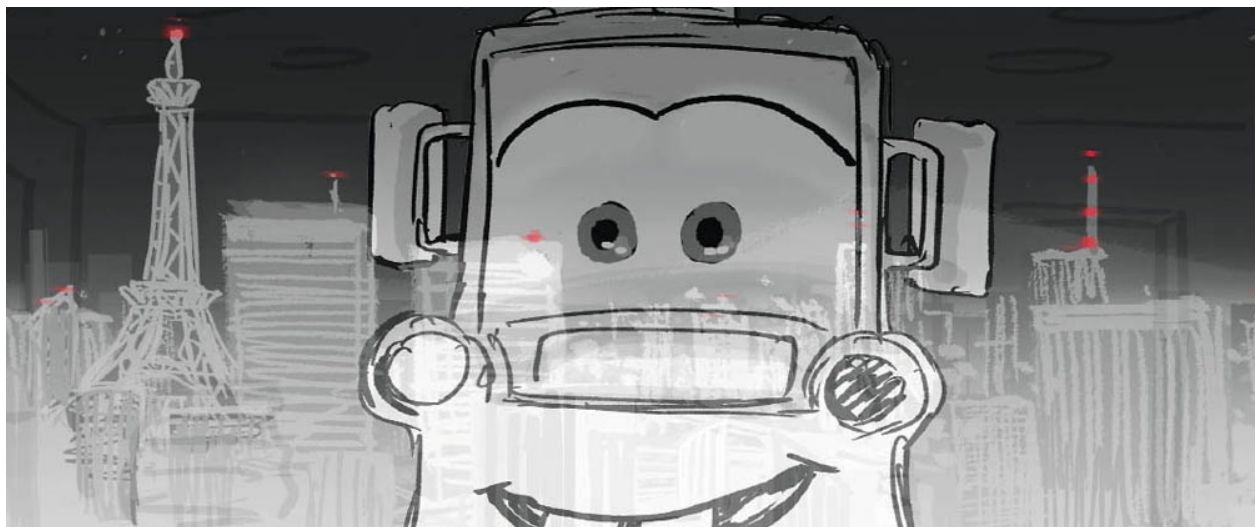
Storyboard, **Nick Sung, Enrico Casarosa**, Digital, 2009.
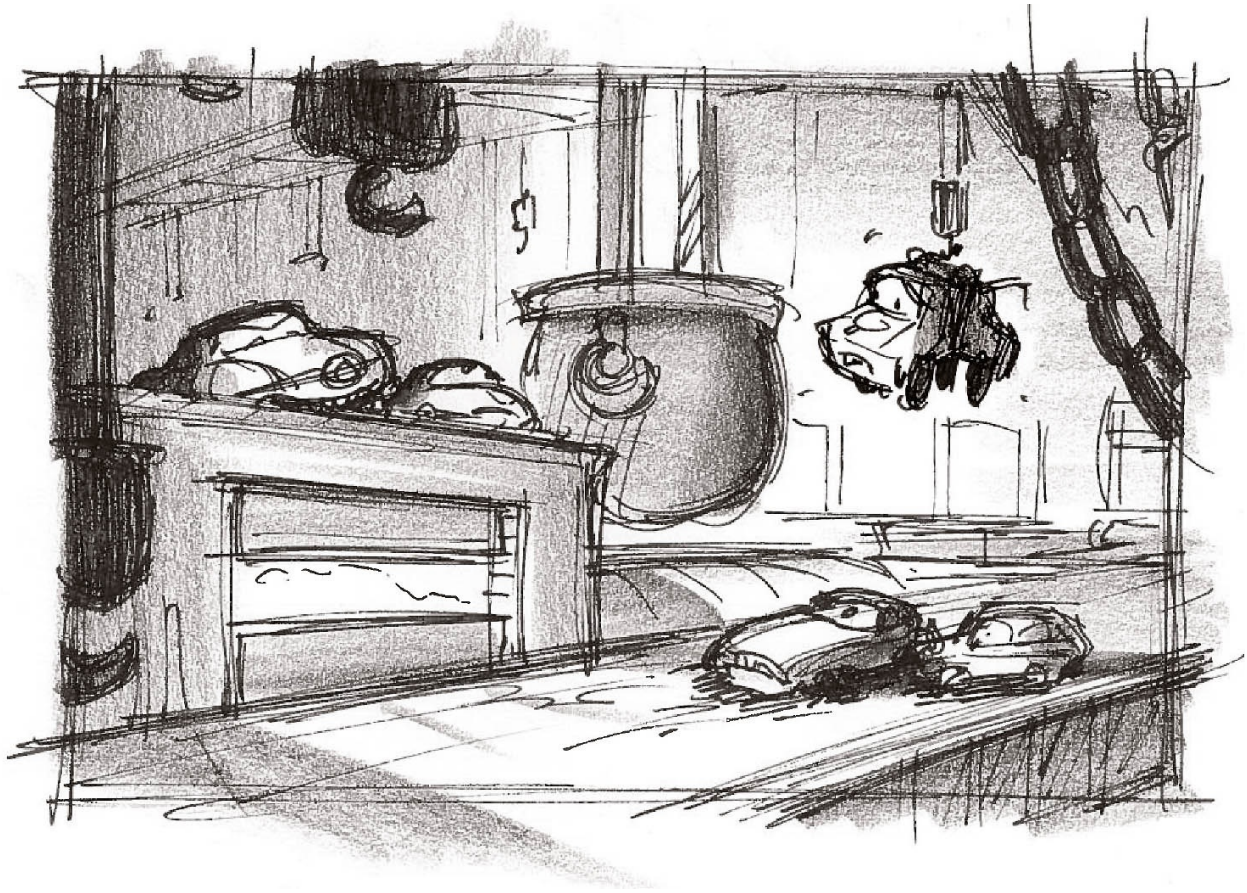
Nate Stanton, Pencil/Digital, 2008.

"I think Mater resonates with people because he just is who he is; there's no pretense to him. He wears his rust with pride."

— *JAY WARD,* Cars *franchise guardian For Mater the tow truck to be a true unwitting Hitchcock hero like Roger Thornhill, Dr. Benjamin McKenna, or John Jones (North by Northwest, The Man Who Knew Too Much, and Foreign Correspondent, respectively) his importance to the story could not simply end with a piece of "mistaken identity" plotting. Like Hitchcock's protagonists, Mater is an idiosyncratic character who, though easily dismissed as an "everyman," in fact brings a specialized skill set to bear in the film. He is savantlike in his knowledge of all things towing, salvage, and auto repair. Mater is mistaken for an American secret agent and finds himself thrust into a world of high-octane spies. Yet it's his understanding of obscure British engines and car parts that ends up saving the day. Put simply, without Mater, the bad guys would have gotten away with it. He's not an everyman, an idiot, or even a wise, Feste-like*

Shakespearean fool. He's a simple country tow truck, nothing more, and this makes him twice the hero all the other cars with high-tech gadgets and hyperanalytic minds will ever be.

**Nat McLaughlin**, Pencil/Digital, 2009.

THE WORLD OF CARS

"The first film was definitely a car's world," says Bob Pauley, production designer on *Cars* (2006), "though you saw a blimp and an airplane or two. In *Cars 2* you're seeing a lot more of the other elements of that world. There are boats, and more planes, and cranes."

This process starts with the "car-ification" of each location. "One of the ideas we developed in the original *Cars* was that, in the same way we see humans and human faces in rock formations and clouds and things like that, cars see cars and car parts in their natural surroundings," says Lasseter. Production designer Harley Jessup took this idea one step further for the sets for *Cars 2*, designing buildings that use car parts—grilles, lights, and other car elements—in their architecture. "That made it so special," Lasseter says. "You see all these icons that we're familiar with, but they're fresh and different because they're from a car's point of view." Art manager Becky Neiman agrees: "It's exciting to see all of these iconic landmarks 'car-ified,' like the Tokyo Tower or Arc de Triomphe made up of different car parts. All of these monuments, upon closer look—you're like, wow, that window is a car grille, or the top of the Eiffel Tower is a spark plug."

The hard work of the *Cars* creative team, which clearly defined the rules of the *Cars* world, allowed the *Cars 2* crew to focus on expanding the world's scope, something they felt was necessary. And this went beyond simply dropping into new countries.

Environments art director Nat McLaughlin says, "Early on we'll ask what we can build to make sure we have the essential bits of dressing that provide the character of these countries: classic London phone booths, those light poles that you see in Tokyo all over the place—just the seasoning that you see in those countries that will provide the flavor of the production design of these sets."

Harley Jessup and the *Cars 2* art department started by listing the iconic aspects of each new location. "One of our major goals has been to caricature the design and spirit of each of those countries [Japan, France, Italy, and England]," says Jessup. "And by caricaturing, I think of it as celebrating. Our approach is to show those locations in the most beautiful way we can. So we're building a design structure based on the most significant features of each location." In this regard, the *Cars 2* team found another corollary to the Master of Suspense. Alfred Hitchcock's approach to building narrative was not limited to his characters. In choosing locations for *Secret Agent*: "I [Hitchcock] said to myself, 'What do they have in Switzerland?' They have milk chocolate, the Alps, village dances, and lakes . . . [so] we used lakes for drownings, the Alps to have characters fall into crevasses, and a chocolate factory for the chase. All of these national ingredients were woven into the picture."
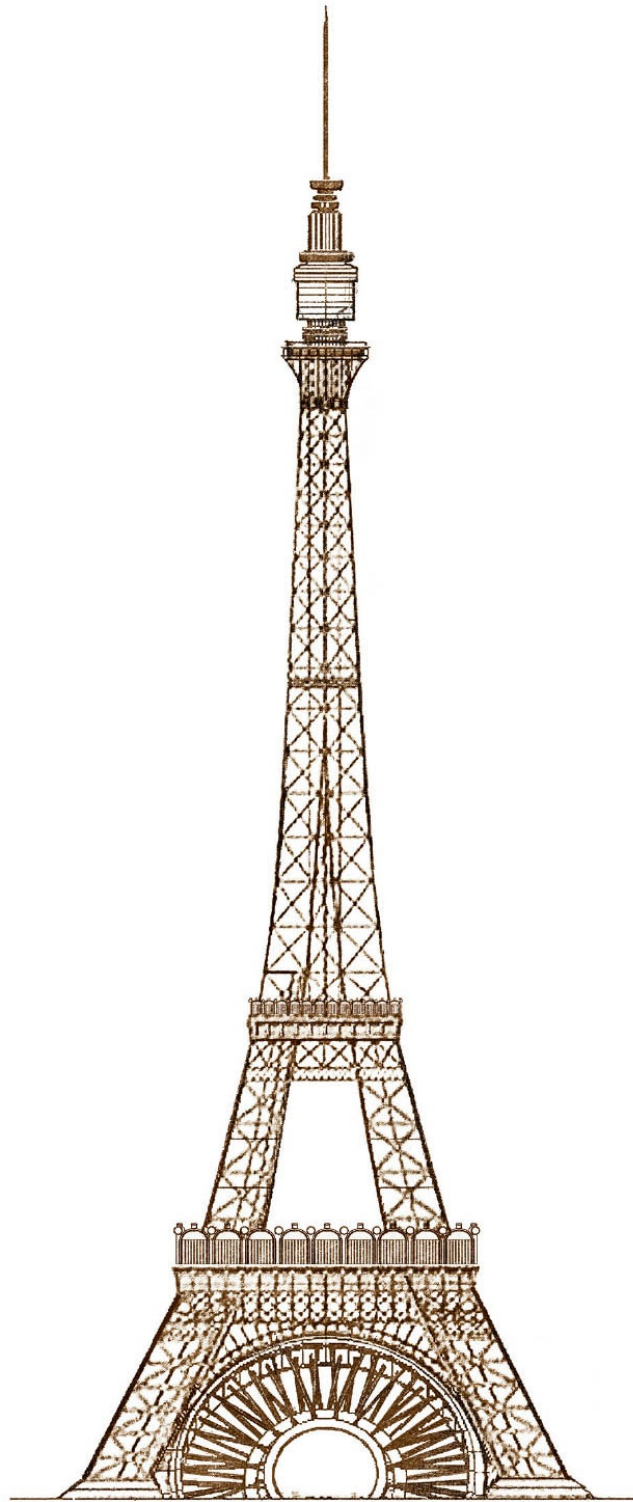
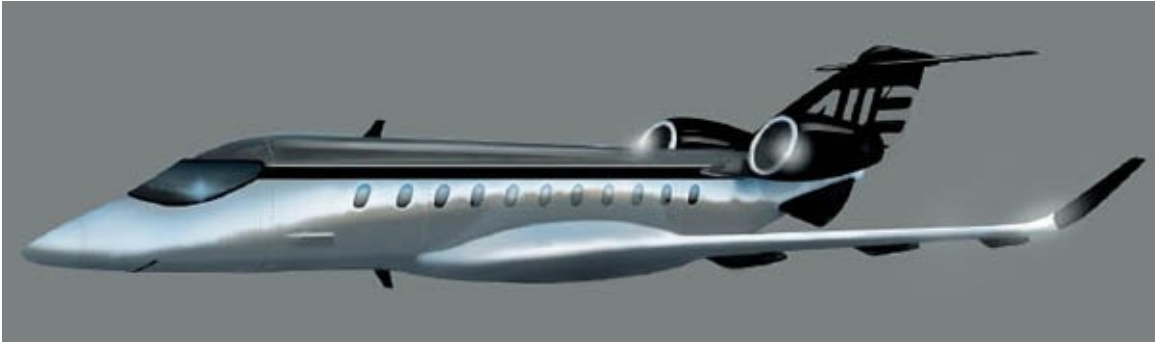**Armand Baltazar**, Digital, 2009.
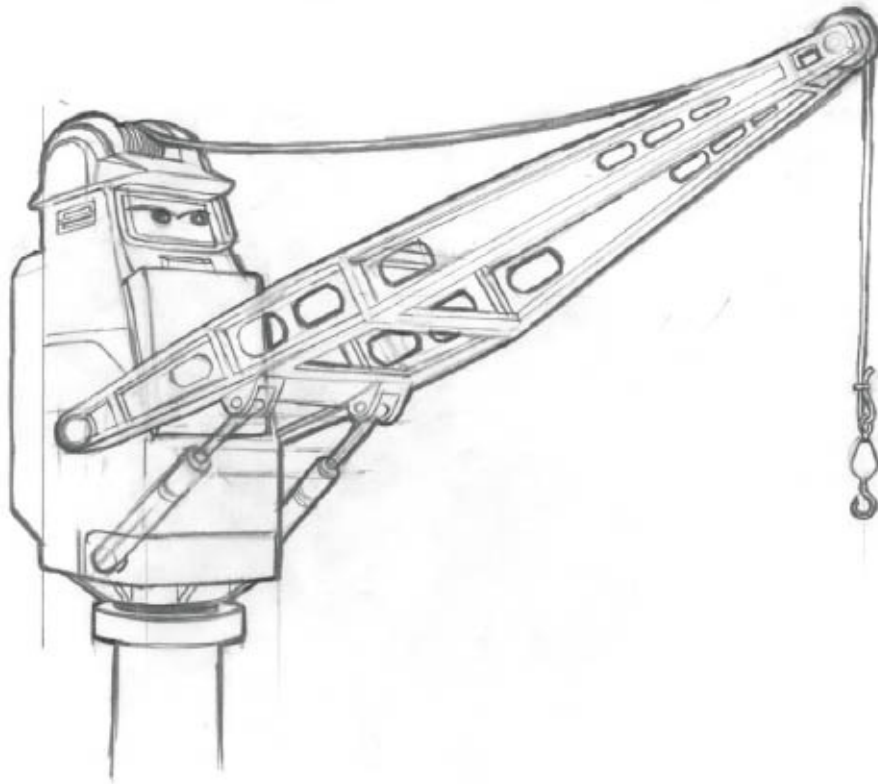
Dan Holland, Pencil, 2009.

Grant Alexander, Pencil, 2009.

Bill Zahn, Digital paint over character render, 2009.


Armand Baltazar, Pencil/Digital, 2009.

Model Packet, **John Nevarez**, Digital, 2009.

For Jessup, though, he hopes the design strategy can, at its simplest, evoke a feeling—to "show each culture in a way that is appealing, and unforgettable."

The overall look of the movie has evolved from the original, along with the story. The analogy, used by Brad Lewis and others on the crew is "NASCAR is to *Cars* as Formula racing is to *Cars 2*." Formula racing, along with the spy world, has added a dimension of glamour not common along the dusty roads of Carburetor County. It's a look that flows cleanly out of the story. "We're taking a genre leap to this international spy conspiracy movie set in Europe," says Sharon Calahan, director of photography-lighting. "So I think that we want to represent that genre leap visually as well."

This idea—the symbiosis of form and content—is something that the art department aspires to every day. "The visual structure of the film grows out of the story structure," says Jessup, "and in the spy film genre each of the locations has to be exotically different from each other. When you combine that idea with a whole world designed for and by cars you get a really exciting mix of settings and characters."
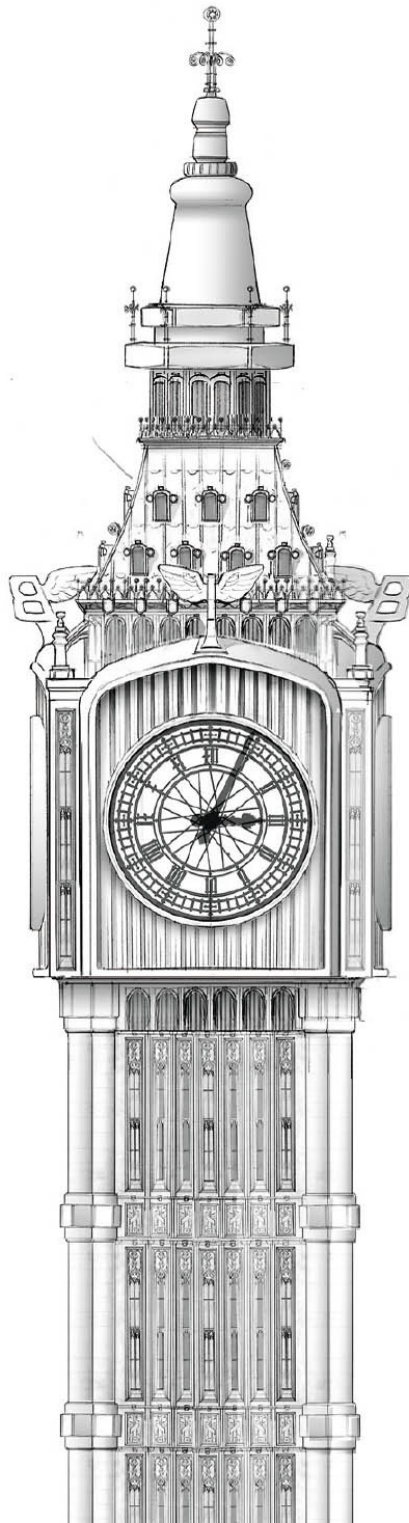
Model Packet, **Nat McLaughlin**, Pencil/Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"BETTER, FASTER, AWESOMER."

On September 24, 2008, it was announced that *Cars 2* would be released a full year ahead of schedule, jolting the production with a dose of much-needed reality. As with all Pixar films, the *Cars 2* team members were focusing much of their energy on getting the story "right." Many major issues had yet to be resolved, including landing what Pixar considers to be the key ingredient of every great film: its heart. "That's always one of the challenges in creating a new story with a sequel," says Lasseter. "Where can you mine the heart again? You can't have Lightning McQueen unlearn everything he learned in the first film."

The pace of the production picked up dramatically. But, though it became the first Pixar film to be completed in a three-year production schedule, on twelve-week screening turnarounds, the quality of work was not diminished. "Everyone's still designing to a high level of detail," says Brad Lewis. "Instead of getting push-back from our technical directors, all we're hearing is . . . 'we can do it.'" Producer Denise Ream: "Far and away, *Cars 2* has more locations and environments than any other Pixar film to date. We've got seasoned veterans in all twelve departments and everyone's standards are very high." Harley Jessup concurs: "The strength of our creative and technical teams is inspiring. Nobody's overwhelmed by the scope of the movie. The people I'm working with are at the top of their game and this, along with the new technology, is making it possible to do things that have never been done before."

For example, the climactic car chase through London essentially required the construction of a complete city. While the sets team built Tokyo and Porta Corsa from scratch, London required over fifty miles of city streets lined with complex period architecture. Starting from an accurate road map of London, the sets team built a detailed kit of modular building parts based on Georgian, Queen Anne, Victorian, and Edwardian architectural styles. These building sets were combined in an infinite variety of sizes and shapes, growing up out of the London city blocks. With the addition of certain custom featured buildings and set

dressings, the result was an astonishingly detailed, "car-ified" version of London that blended seamlessly with the earlier work done on Tokyo and Porto Corsa.

"With every Pixar film," says Brad Lewis, "there's an attempt to do something that hasn't technically been done before. With *Cars 2* the most noticeable thing is the massive scope of the production. Scope and scale." Jessup agrees: "For an interior set, cars work best in a huge space. It helps that the cities we're showing were built on a grand scale. We've further enlarged landmarks like Big Ben (actually 'Big Bentley') and Buckingham Palace in London, the Eiffel Tower and Arc de Triomphe in Paris, along with the Rainbow Bridge and the Imperial Palace in Tokyo."
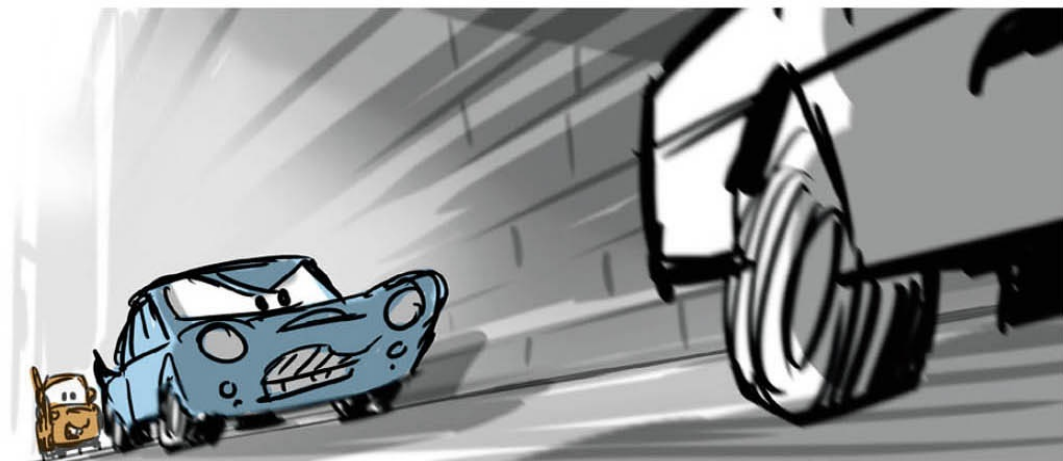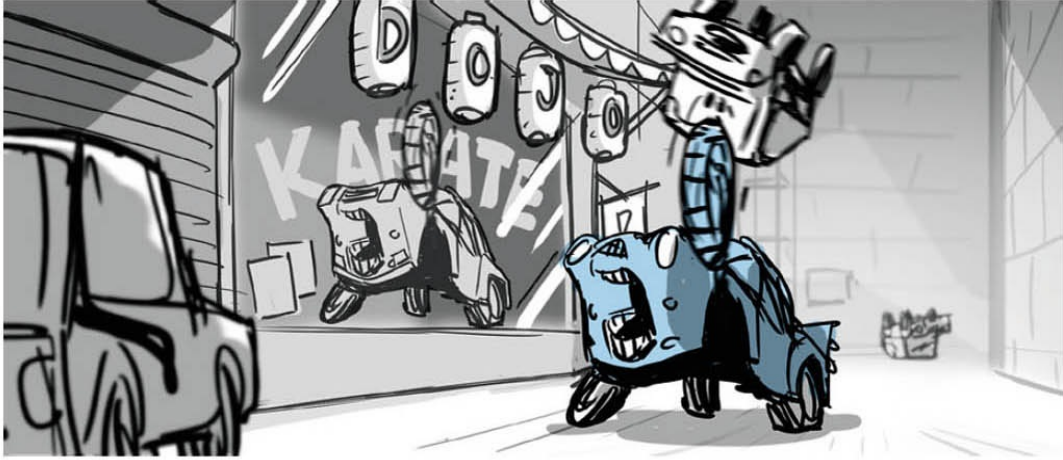
Storyboards, **Scott Morse**, Digital, 2010.

John Lee, Digital, 2009.

"The daunting part about this movie was that we essentially had to design for five movies: four countries, plus the spy and race worlds. On top of that, we're a film of 'one-offs'—almost every set is only used once. So we had to be extremely clever about how to build and populate our environments."

—*DENISE REAM, producer*

Storyboard, **Bill Presing**, Digital, 2010.
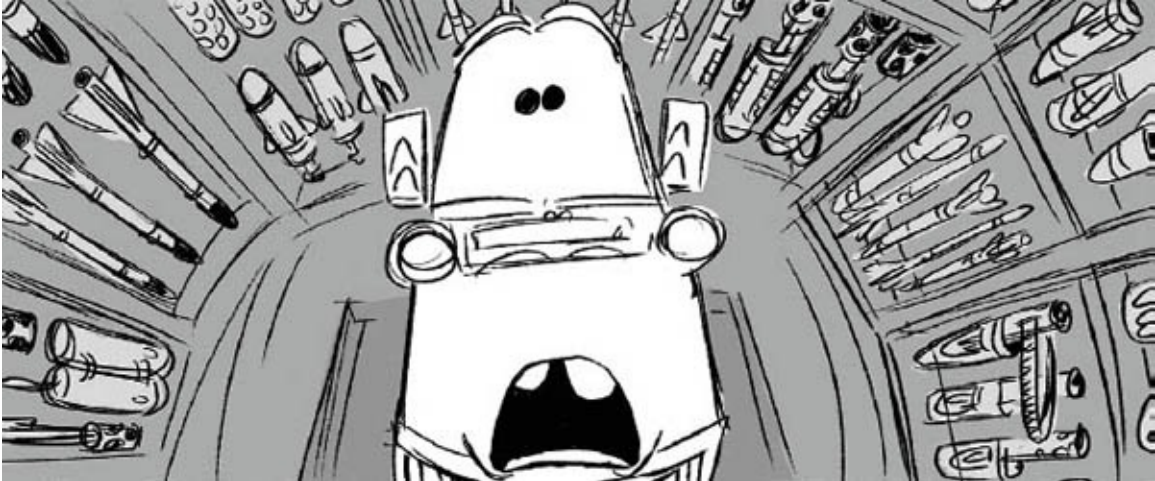
Storyboard, **Josh Cooley**, Digital, 2010.

Alejandro Leon, Digital, 2009.

In much the same way that a movie's story can help form the visual style, the production's speed became a clear correlative to the style of the movie itself, something that was felt strongly in every department. The first film (the theme of which was about slowing down and enjoying life) purposely used a shooting style more akin to a Western or a small-town movie.

According to director of photography-camera Jeremy Lasky, *Cars 2* "moves quickly through different sets and locations. It's more of a travelogue style, where you get glimpses of things in one location or one

country, and then you're off." Or, as character supervisor Bob Moyer describes, each task on *Cars 2* is approached with the desire to be "better, faster, awesomer."

"We're going to four different countries in the film, so there are four completely different worlds to research, design, and then 'car-ify!' And still, the artists' attention to detail was always there—every detail, down to the lugnut in the center of the 'car-ified' flowers."

—BECKY NEIMAN, art manager

And what of the film's heart? Ultimately, the friendship between Mater and McQueen that was created in *Cars* is put to the test in *Cars 2*. "Once we started exploring the idea of a flaw in their friendship, an imbalance, the door seemed to finally open up for us," says head of story Nate Stanton. "McQueen and Mater are best friends, of course, but how would their friendship do when they left their comfort zone of Radiator Springs?" Mater's behavior, which is fine in Radiator Springs, becomes embarrassing and uncomfortable for McQueen when exported internationally. After Mater's seemingly cavalier actions cause McQueen to lose the first race, the two friends have a fight in which the imbalance in their relationship is exposed. Over the course of the movie, both Mater and McQueen realize in their own way what is broken, and what they both need to do to fix it. "Everything else in the story hopefully services this fractured, then fixed, friendship," says Stanton.

Harley Jessup, Digital, 2010.

John Lee, Pencil/Digital, 2010.
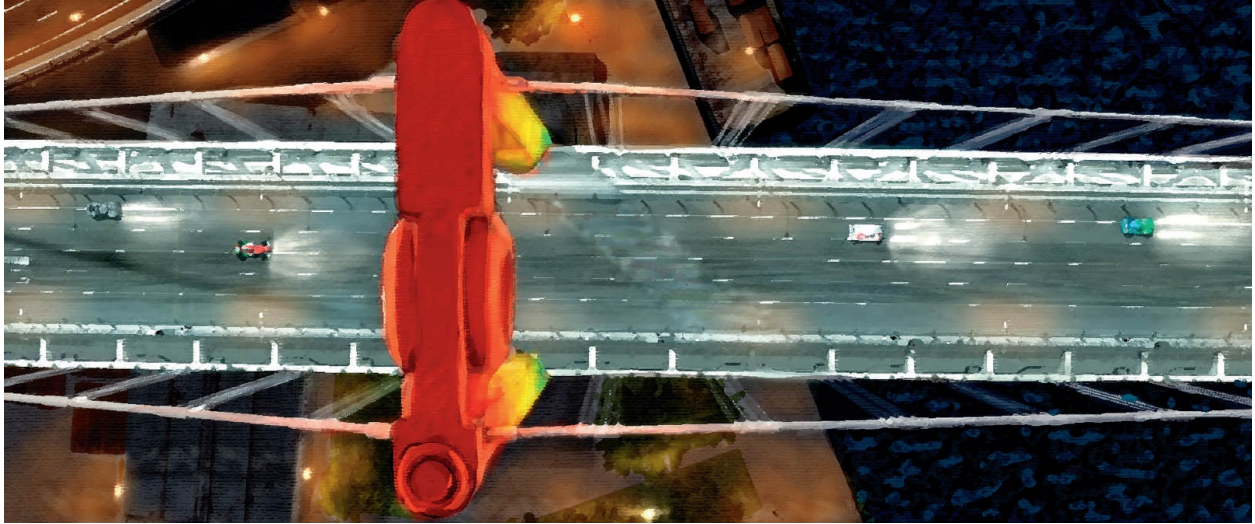
Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

THE PACIFIC OCEAN

Armand Baltazar, Digital, 2010.

Kristian Norelius, Pencil/Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"I really wanted to start off with something that was the complete opposite of what the audience would expect from the sequel to Cars. People are expecting to see Lightning McQueen, Mater, NASCAR-style racing, Radiator Springs, Route 66, the Southwest . . . but instead, the first thing you see is ocean. And then there's a boat. And out in the middle of the ocean, there's a little car riding on this boat and he's looking for another car. You're thinking, 'Wait a minute—what's going on here?!'"

—JOHN LASSETER, *director*

The decision to give *Cars 2* an action/suspense opening, so wildly different from the first film, inspired the *Cars 2* creative team and evolved into a key collaboration between the art and story departments. As sketch artist Kristian Norelius designed the offshore oil platform that Finn McMissile would sneak onto to save his colleague, story artists Scott Morse, Bill Presing, Alex Woo, and Bobby Rubio boarded each beat, shot by careful shot. Said Norelius of his initial approach to the platform's design: "After looking at reference photos I took out my pencil and just started sketching. With a big thing like a derrick it's important to get everything out of your brain as fast as possible."

The story team's approach was similar: "With the spy opening, we figured we could get some unique energy into the work if we set aside our Cintiqs and Photoshop for a couple of weeks," says Scott Morse, "so we pulled out pads of paper, some 4B pencils, and brush pens and started drawing. We got our hands dirty with graphite and ink, and littered the floor with crumpled paper instead of sitting in our office hitting hot keys."

As the sequence unfolds, with Finn McMissile rappelling up the side of the massive rig, the sheer verticality of the set becomes evident—yet another thing that differentiates *Cars 2* from its predecessor. "In the first movie, there wasn't a lot of reason for extreme camera angles or up and

down shots, unless you're a helicopter looking down on a race," says story artist Brian Fee. "In the sequel, mostly because of the action, the camera is opened up, spatially, so you're not just looking at a horizon."
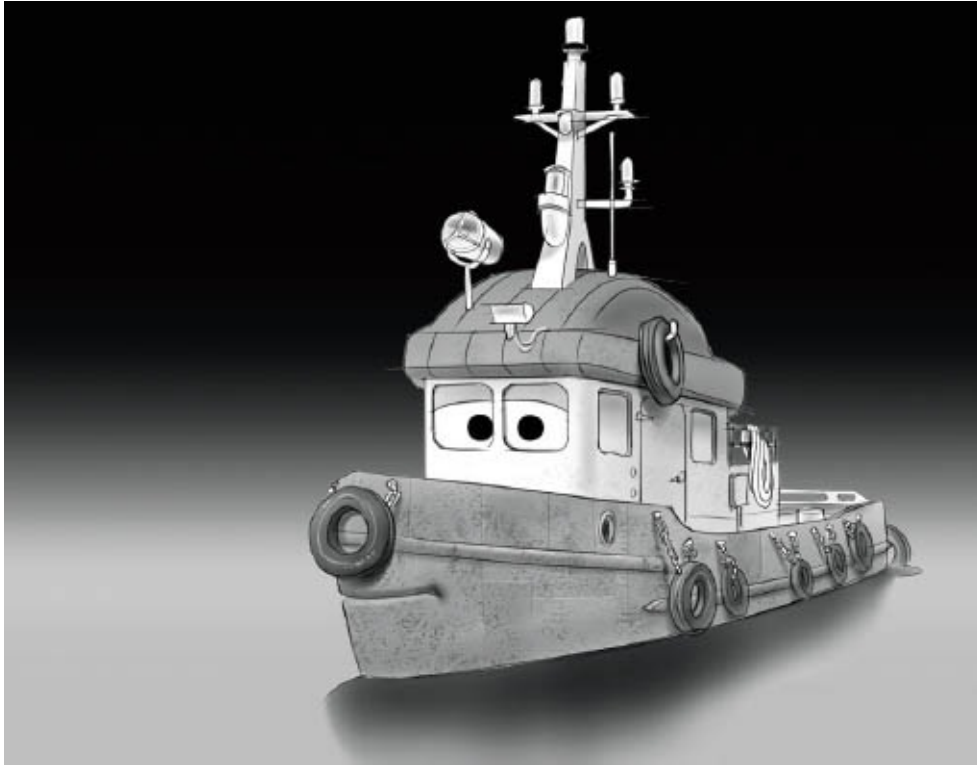
The scale and depth of the set is never better illustrated than toward the end of the sequence, when McMissile dives from the top of the oil platform and into the water. The subsequent chase and final smash cut to sleepy, pleasant Radiator Springs set the stage for the rest of the movie. "As a storyteller, you're promising that these two worlds—the world you're familiar with and the world you're not familiar with—are going to collide somehow," says Lasseter. "And as a moviegoer, if I see that, it's like, 'I'm in.'"

Oil Rig Design

1900' Feet

Helipad

Lets dress these details in a way that we can put a clear path here Finn to check up!

Loading dock

737' Feet
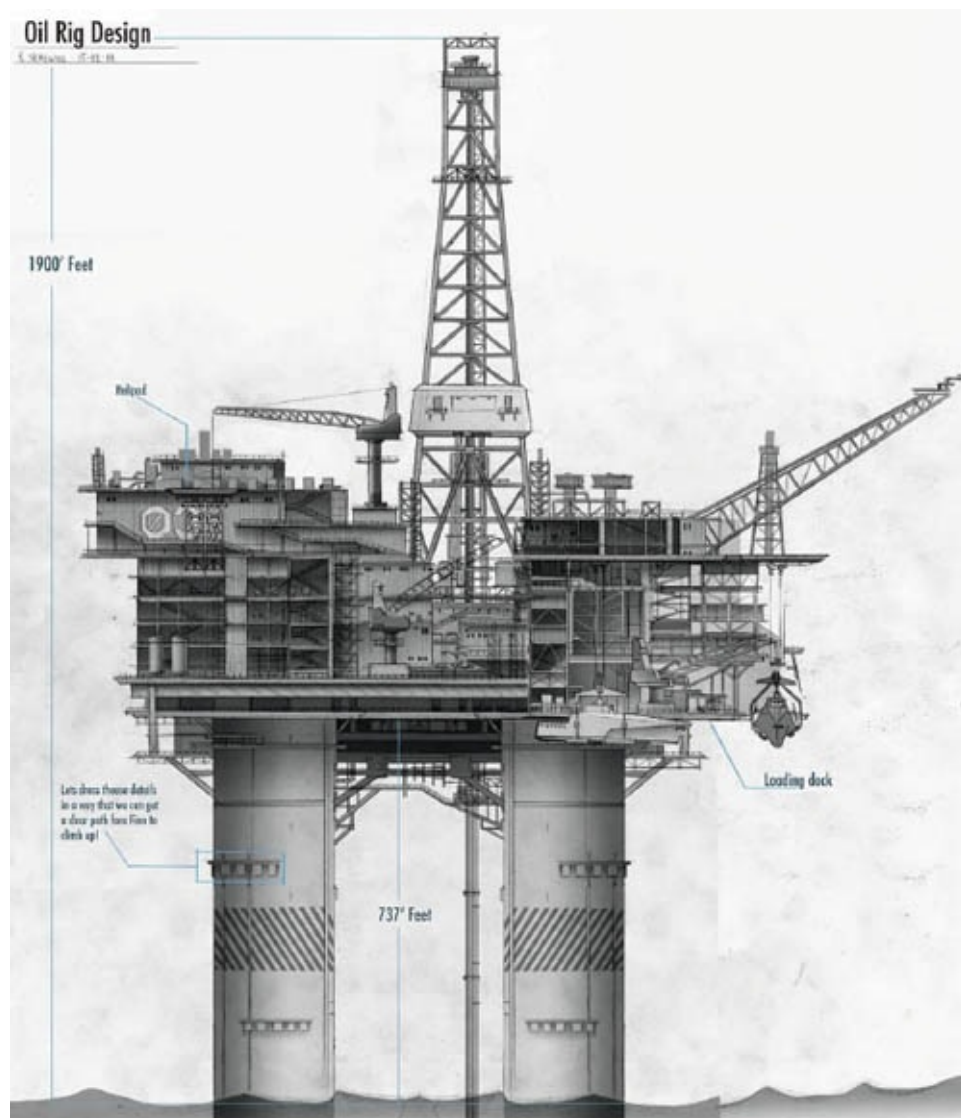
Model Packet, **Kristian Norelius**, Pencil/Digital, 2010.

CRABBY

Grant Alexander, Pencil/Digital, 2009.
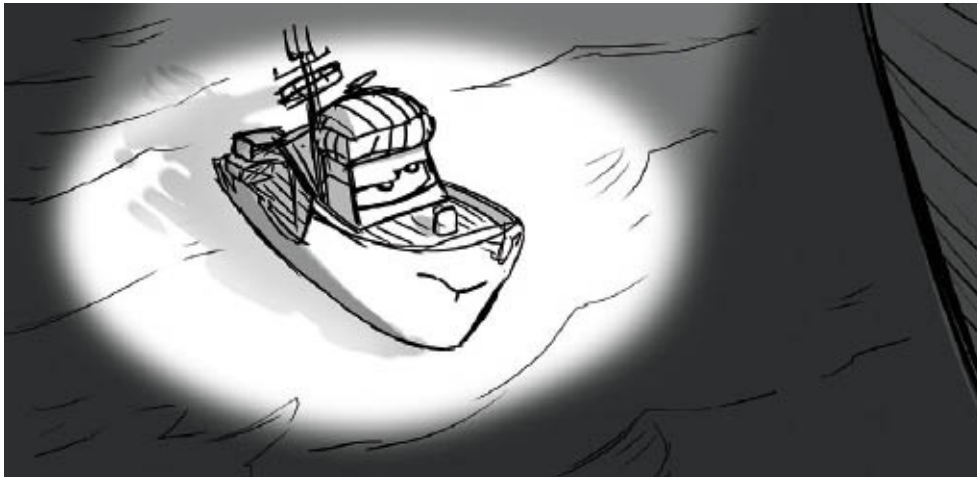
Storyboard, **Scott Morse**, Digital, 2010.

Storyboard, **Bobby Rubio**, Digital, 2010.

Grant Alexander, Digital, 2010.
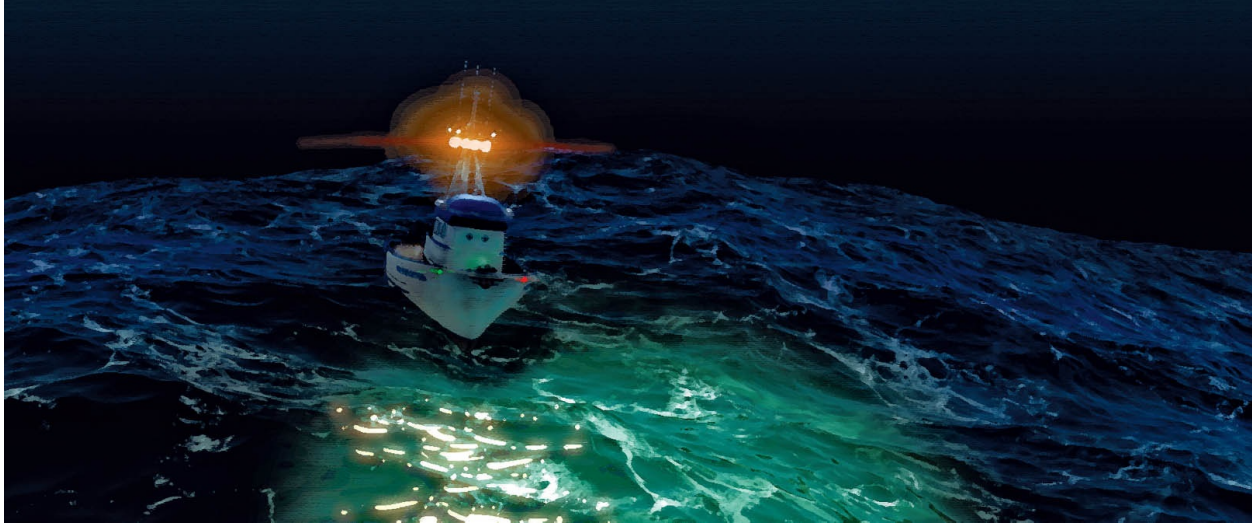
Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

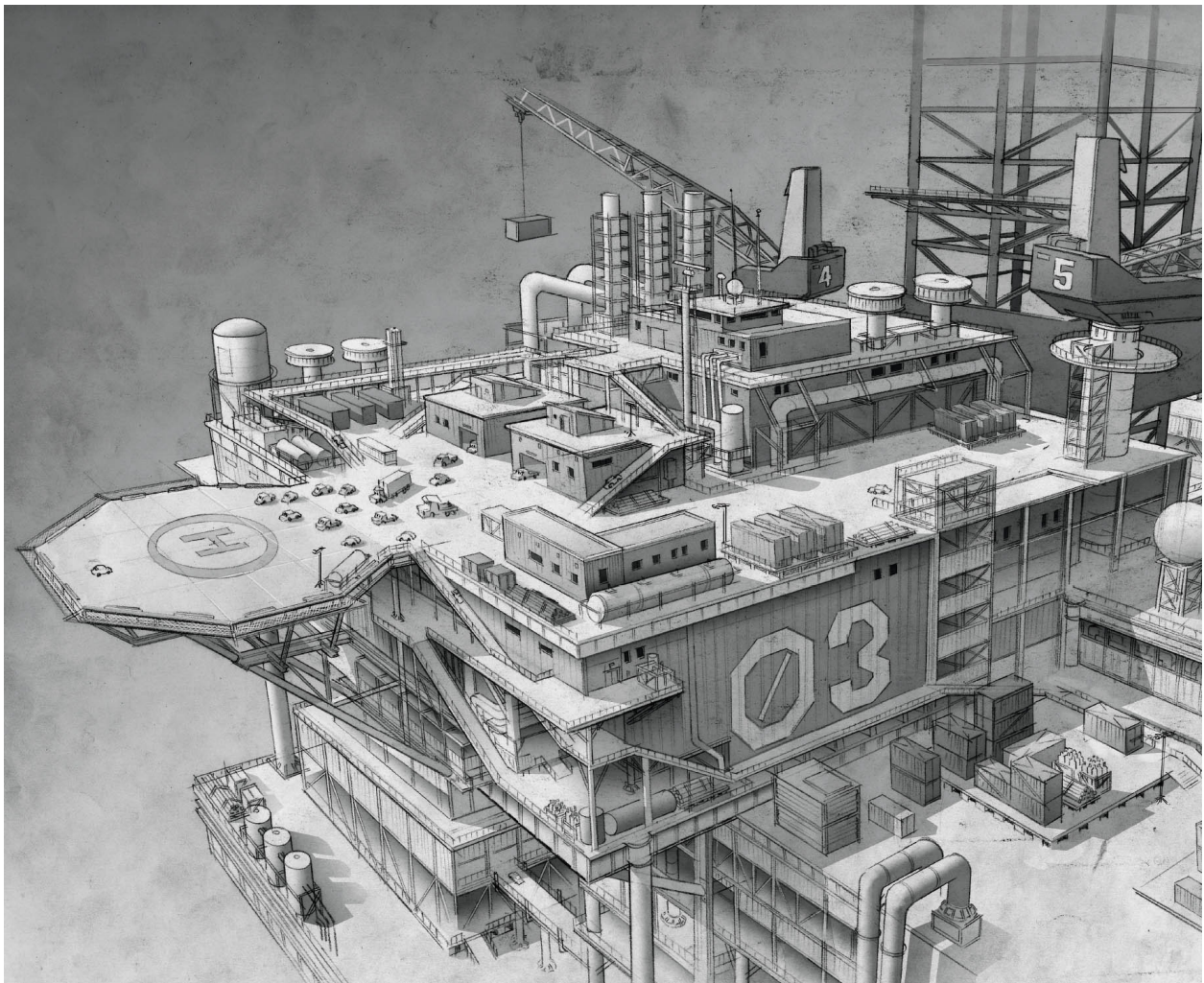# COMBAT SHIP
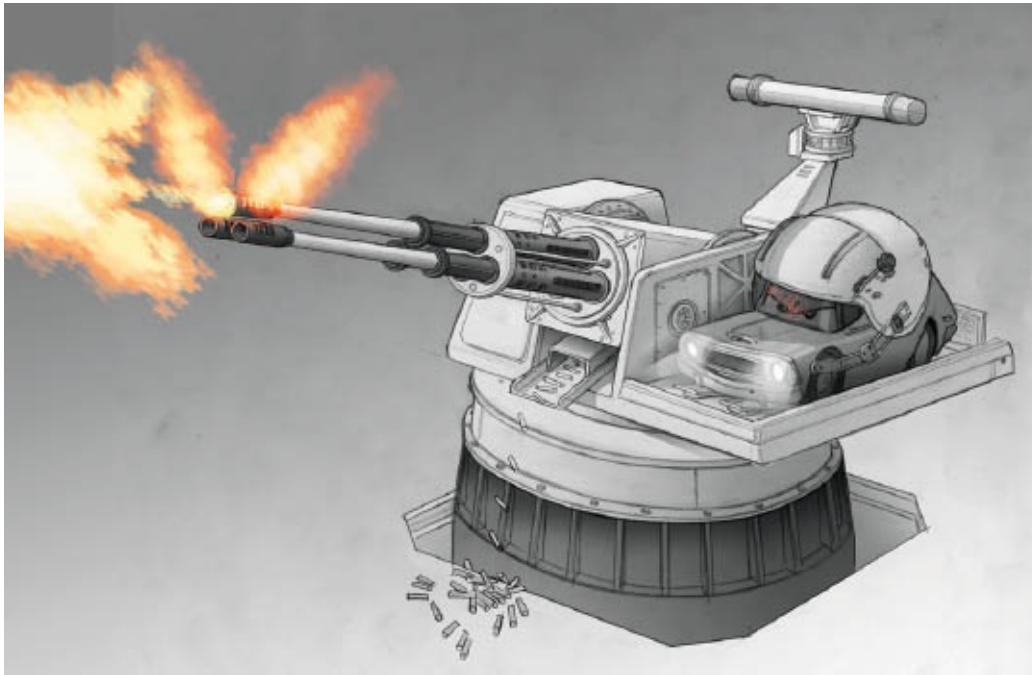
Kristian Norelius, Pencil/Digital, 2010.

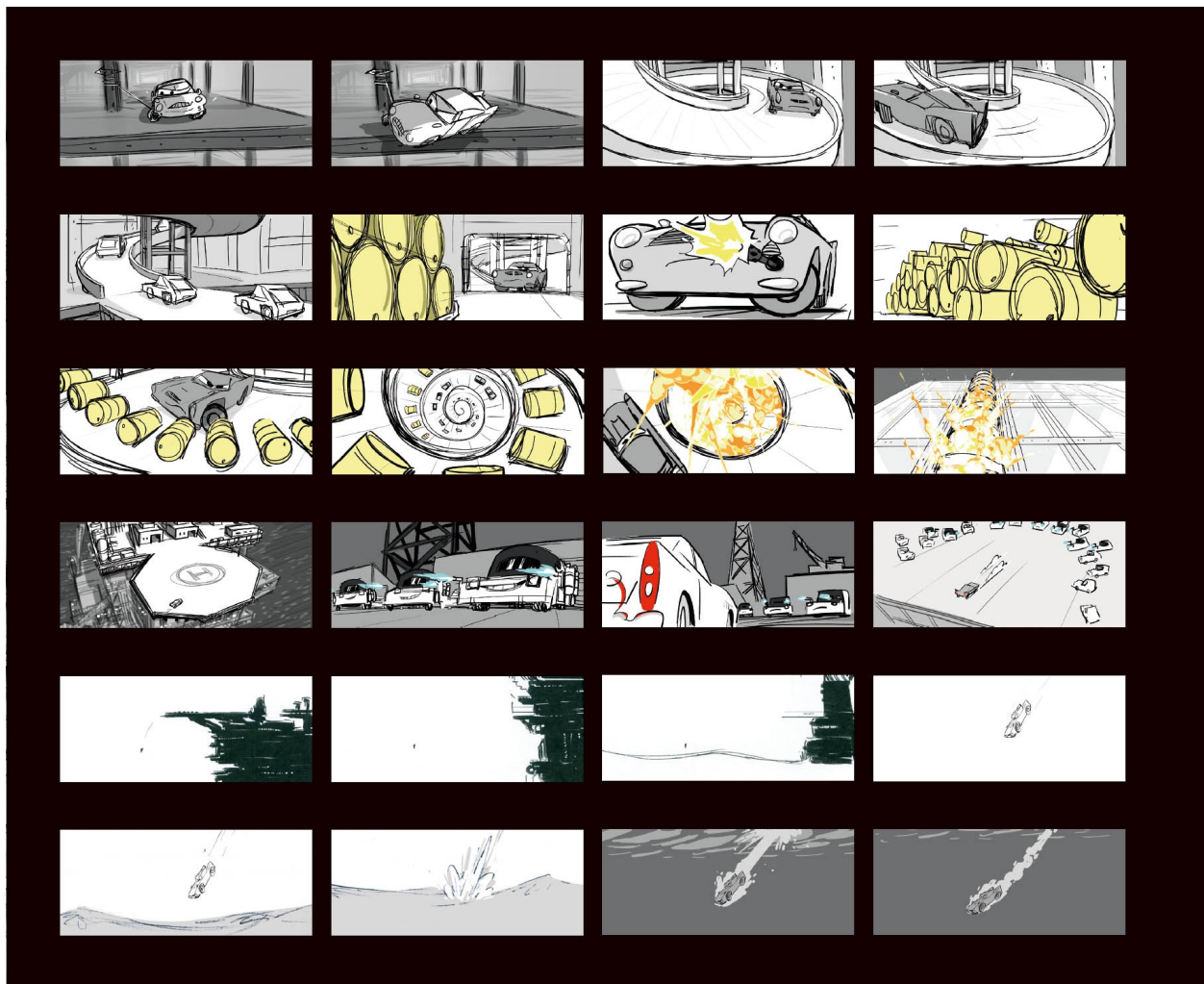**Kristian Norelius**, Pencil/Digital, 2010.
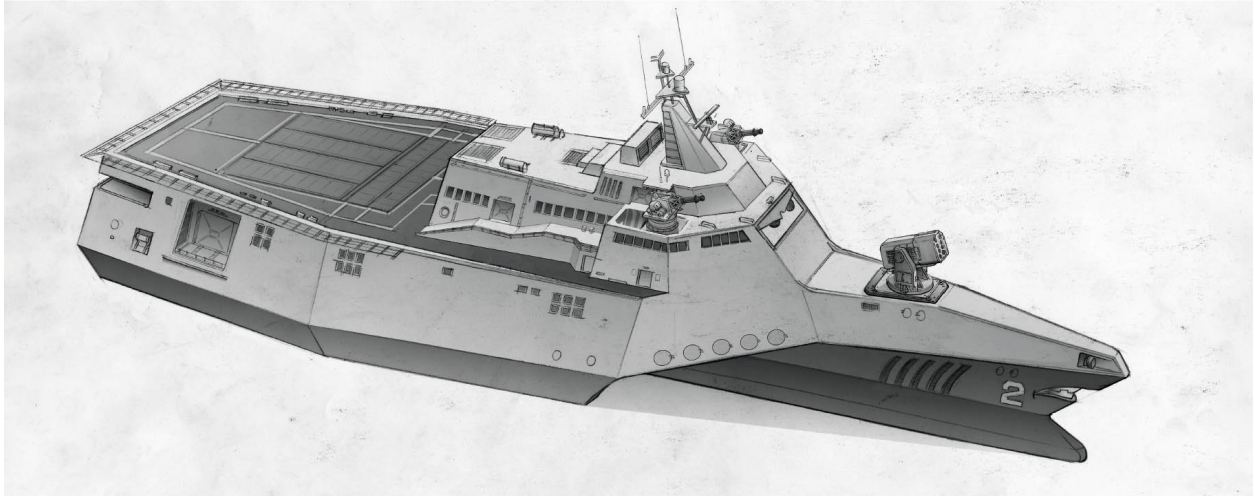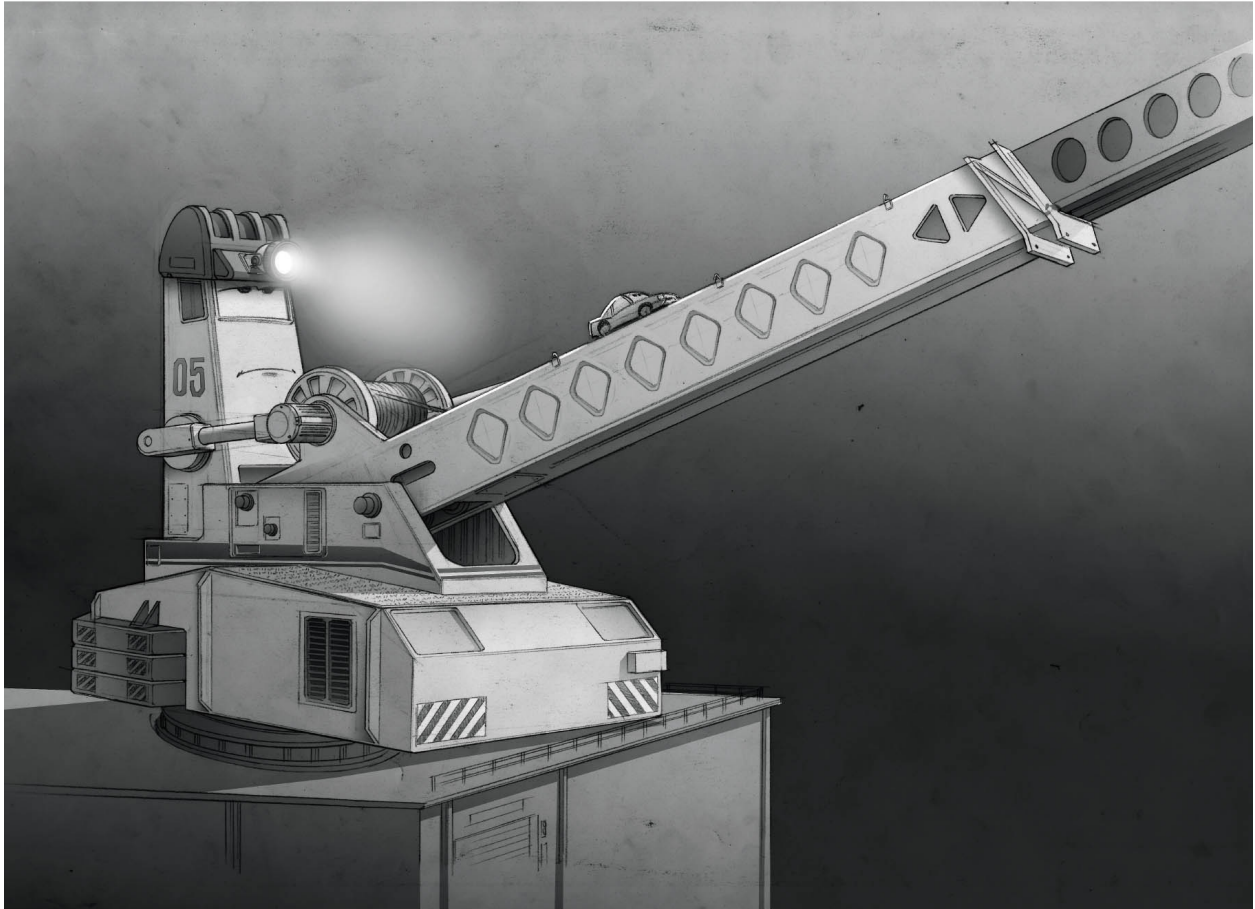
Kristian Norelius, Pencil/Digital, 2010.

Kristian Norelius, Pencil/Digital, 2010.

Storyboards, **Bill Presing**, **Alex Woo**, **Kevin O'Brien**, **Scott Morse**, **Andy Jimenez**, Digital, 2010.

Kristian Norelius, Pencil/Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"I love the way we're opening the film: going out on that
oil derrick in the middle of the ocean, and then cutting

back to Radiator Springs and seeing our friends from the first movie. It really whets your appetite—you know you're in for something special."

—DENISE REAM, producer

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

FINN McMISSILE

Storyboard, **Rob Gibbs**, Colored pencil/ink, 2002.
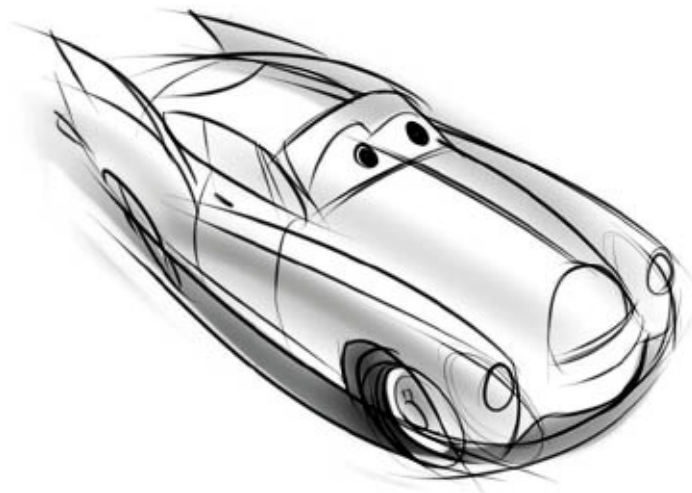
Jay Shuster, Digital, 2008.

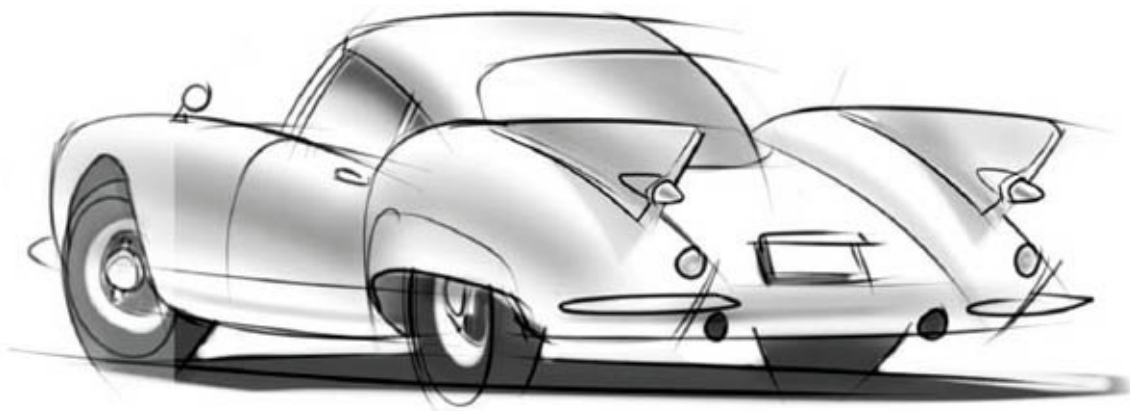**Jay Shuster**, Digital, 2008.
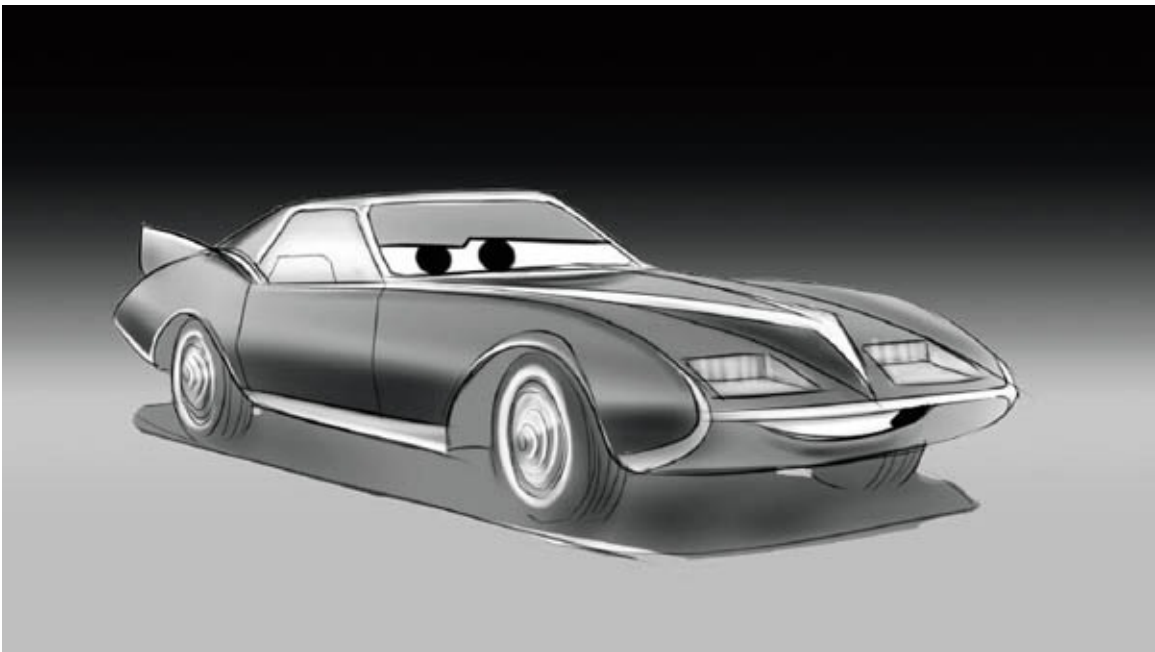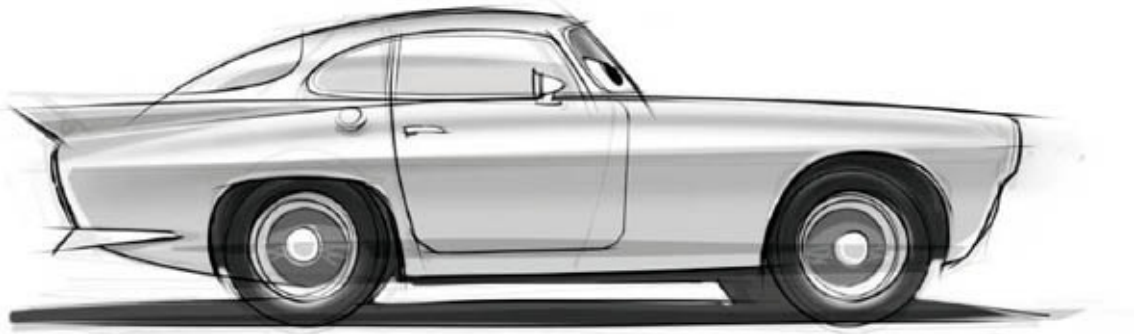

Grant Alexander, Pencil/Digital, 2008.

Jay Shuster, Digital, 2009.
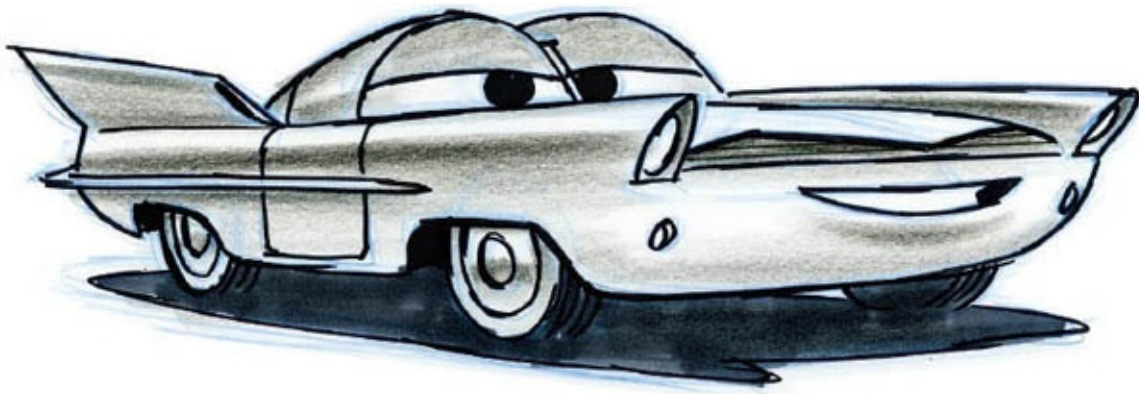
Grant Alexander, Pencil/Marker, 2008.

Jay Shuster, Digital, 2008.

Jay Shuster, Digital, 2009.

Jay Shuster, Color by **Jack Chang**, Digital, 2009.

"Finn is understated and refined, like a proper undercover agent. The fact that his look was complete before we knew all of the stunts he'd be doing was a good thing; it forced me to economize and adapt all the gadgets to his existing base design. This preserved his seemingly unassuming nature and actually helped dial up the impact when his spy tool arsenal is deployed throughout the story."

— JAY SHUSTER, character art director

Jay Shuster, Digital, 2010.

WORLD GRAND PRIX

Armand Baltazar, Digital, 2009.

Mark Holmes, Digital, 2010.

The World Grand Prix was conceived as a competition between the champions of every racing league around the world, with all participants running on a new alternative fuel, Allinol. Like the Piston Cup from *Cars*, the World Grand Prix was wholly a Pixar creation and needed to be designed and executed as if it were an actual racing event. Race logos, car striping and design, fake sponsors, billboards, and storefronts all had to be attended to with care. Says graphics artist Ellen Moon Lee, "The World Grand Prix is the equivalent of the Olympics or World Cup to our *Cars* characters. With that spirit, we set out to design an

identity/brand system that would denote not only a grand scale international event, but also something specifically for race enthusiasts. In our story, this race relates to alternative fuel, so that also influenced our choices of colors, symbols, and overall presence. We set out to infuse this identity throughout the sets as well as the race characters."

The competition was originally imagined as a five-race series in a variety of environments and disciplines: an off-road rally in Germany, a nighttime city race in Tokyo, an endurance race in Paris, a daytime road race on the Italian Riviera, and a track race in the United Kingdom. In order to streamline the story and make each race more suspenseful, it was decided to change the competition to a series of three multidisciplinary courses. Having every race include technical turns, dirt sections, and straightaways provided benefits and challenges for all types of race cars and allowed for a relatively even playing field.

The design of each race began with the course trajectory. Each had certain story needs—a piece of action that had to happen at a precise place and point in the race, or a landmark the directors wanted to include along the way—which became the elements around which the route as a whole was designed. After the path of the race was determined, decisions were made as to the locations of the pits, garages, and stands. Once the basic elements of the set were designed, a previsualization model was created, and cameras put in to see if all the necessary shots could be achieved. Then the process of refining and adding detail began. The filmmakers paid scrupulous attention at every step of the way to the details of the race course, set, and character design, striving to keep each element true to the tone, intent, and function of their touchstone references.

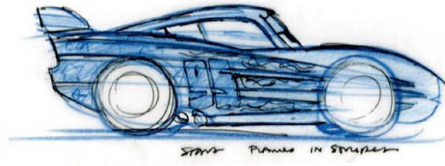World Grand Prix Graphics Exploration, **Ellen Moon Lee**, Digital, 2010.

World Grand Prix Graphics, **Ellen Moon Lee**, Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.
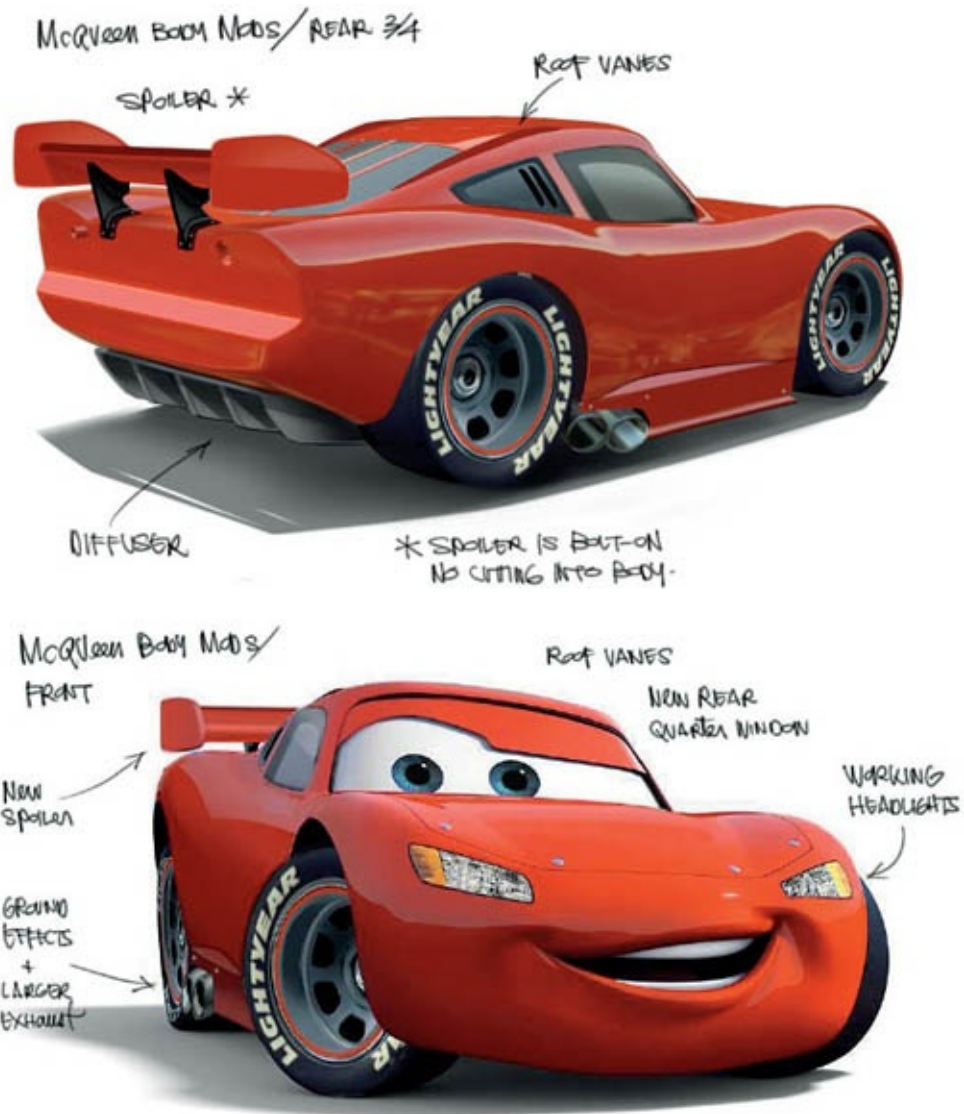
Bob Pauley, Pencil, 2010.

LIGHTNING McQUEEN

Chip Foose, Pencil/Ink, 2010.

"John wanted McQueen to have a new design for this film, one that would make him stand out even against the sophisticated graphic design and bodywork of the other World Grand Prix racers. Flames are one of the quintessential markers of American hot-rod styling and seemed like the perfect motif for McQueen's competition look. McQueen's Cars 2 paint schemes and body modifications, including the more classic look we see at the beginning of the film in Radiator Springs, took a full year to develop, and drew on the talents of a multitude of contributors, from John himself to outside hot-rod designer and fabricator Chip Foose."

—JAY SHUSTER

Annotations on the image:

McQUEEN BODY MODS / REAR 3/4

SPOILER *

ROOF VANES

DIFFUSER

* SPOILER IS BOLT-ON
NO CUTTING INTO BODY.

McQUEEN BODY MODS / FRONT

ROOF VANES

NEW REAR QUARTER WINDOW

NEW SPOILER

WORKING HEADLIGHTS

GROUND EFFECTS + LARGER EXHAUST

LIGHTYEAR

Jay Shuster, Digital, 2009.

Craig Foster, Digital, 2010.

Ellen Moon Lee, Digital, 2010.

FRANCESCO

Jay Shuster, Digital, 2009.
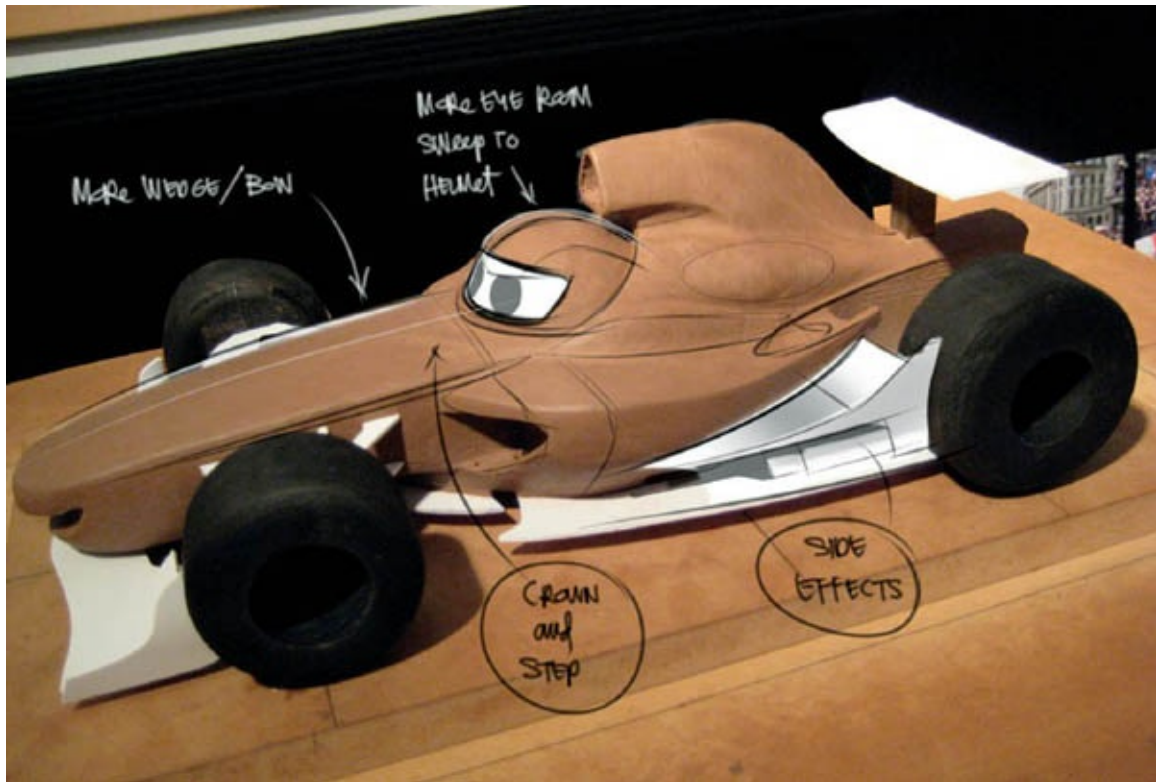
Jay Shuster, Digital over sculpt, **Jerome Ranft**, Clay, 2009.

"Francesco is open-wheeled, totally sexy—the actor who walks around without his shirt on all the time, surrounded by publicity folks who are all swooning over him. So we're really celebrating the idea that you see his 'musculature'—his suspension and his wheels. We're celebrating how sleek and fast and exuberant he is."

—*SHAWN KRAUSE, supervising animator*
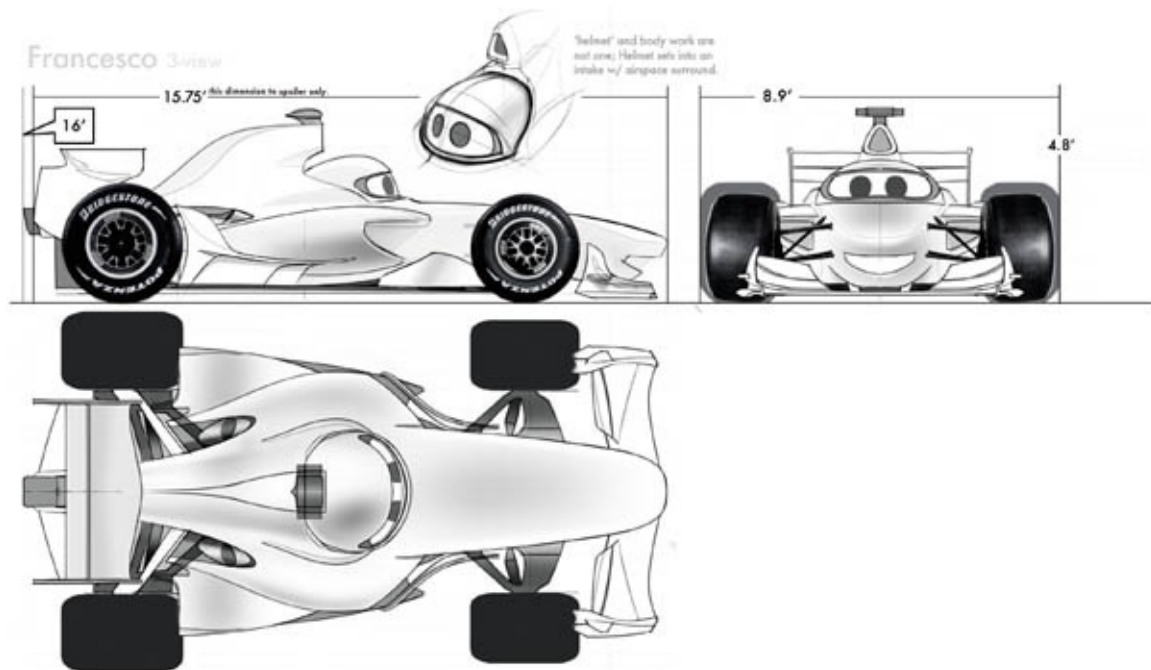
Model Packet, **Jay Shuster**, Digital, 2009.
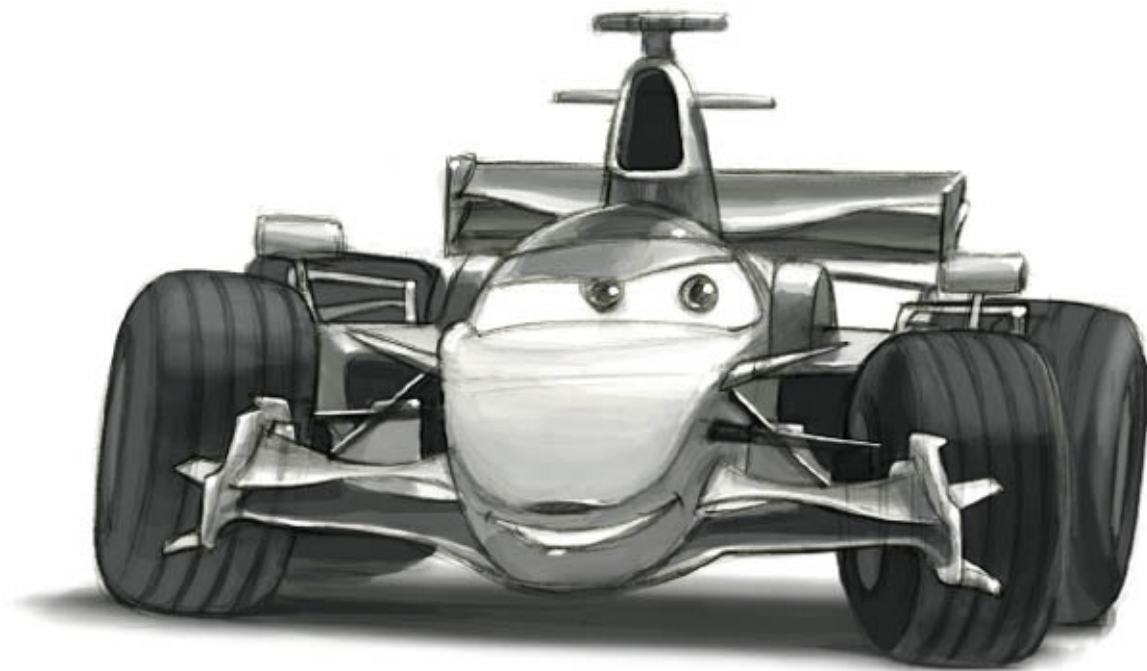
John Lee, Pencil/Digital, 2008.

Storyboard, **Tony Rosenast**, Digital, 2010.

Storyboard, **Bobby Rubio**, Digital, 2010.

WGP RACER DESIGN

Craig Foster, **Ellen Moon Lee**, **Bob Pauley**, **Jay Shuster**, Digital/Pen, 2010 (top).
Jay Shuster, Digital, 2009 (botton left).
Jay Shuster, Digital, 2009 (bottom right).
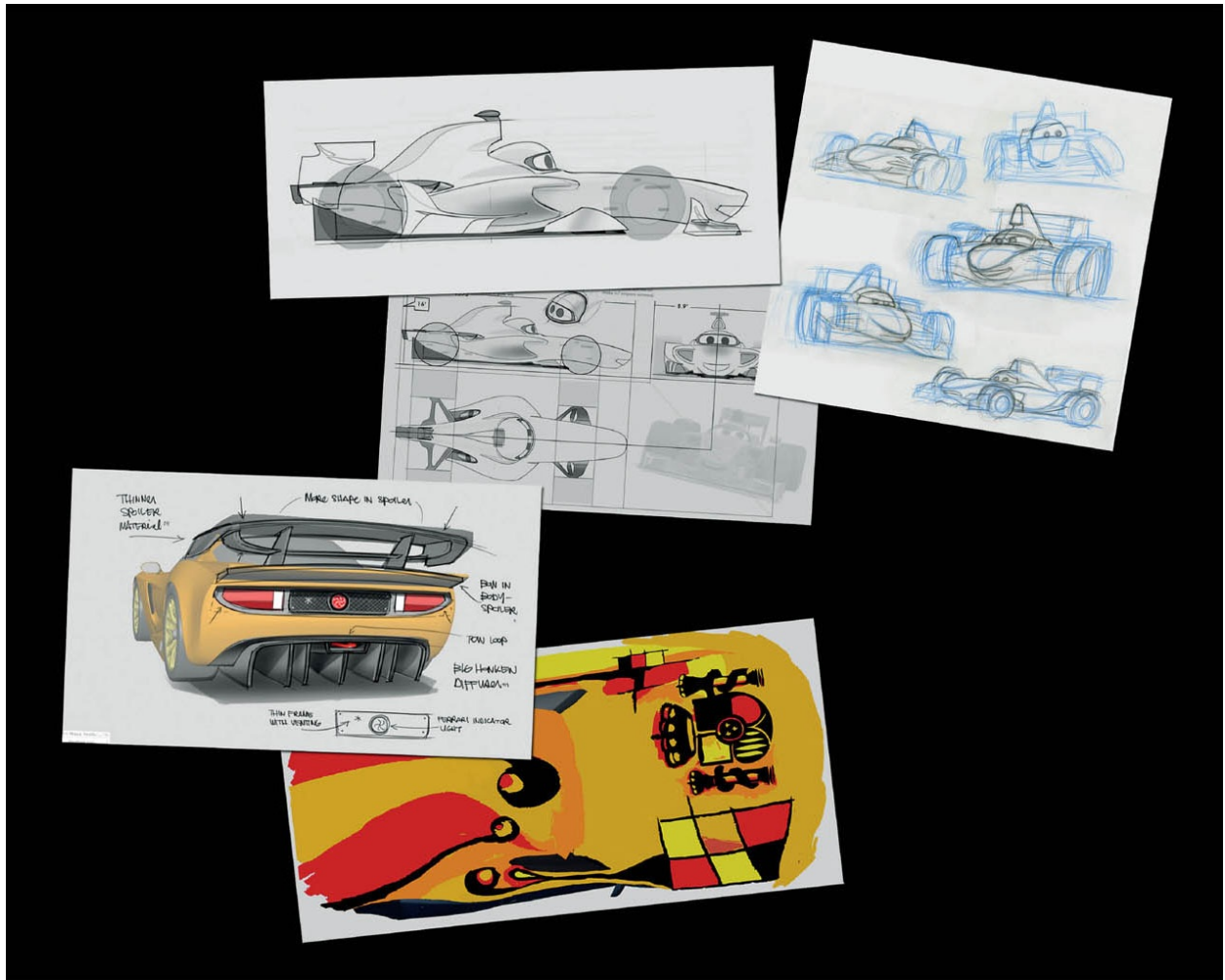
Jay Shuster, Digital, 2010 (top left).
John Lee, Pencil, 2009 (top right).
Jay Shuster, Digital, 2010 (middle).
Jay Shuster, Digital, 2009 (bottom left).
Craig Foster, Digital, 2010 (bottom middle).

"It was a fun challenge to create distinct, easily identifiable looks for each of the different competitors in the race. Their graphics are rooted in the look and style of the overall World Grand Prix design language, but we also tried to incorporate recognizable visual elements from their home countries."

—CRAIG FOSTER, graphics artist

Character design by **Jay Shuster** with **Jack Chang**, **John Lee** & **Grant Alexander**.
Graphics by **Craig Foster** with **Bert Berry** & **Ellen Moon Lee**.
Modeling/Rigging by **Jared Fong**, **Seth Freeman**, **Levi Harrison**, **Michael Honsel**, **Tanja Krampfert**, **Garpi Lo**, **Alonso Martinez**, **Sal Melluso**, **Mark Piretti**, **Andrew Schmidt**, **Kevin Singleton**, **Ian Steplowski**, **Joseph Suen**, **Audrey Wong**.
Shading/Paint by **Trent Crow**, **Masha Ellsworth**, **Sarah Fowler**, **Jamie Frye**, **Patrick Guenette**, **Jonathan Hoffman**, **Michael Kilgore**, **Ana Lacaze**, **Jake Merrell**, **Ling Tu**, **Bill Zahn**, 2009–2010.

International Poster Graphics, **Craig Foster**, **John Lee**, **Marty Baumann**, **Ellen Moon Lee**, **Cassandra Smolcic** & **Jennifer Chang**, 2009–2010.

TOKYO

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Nat McLaughlin, Digital, 2009.

The sequences in the three World Grand Prix locations (Tokyo, the fictional Italian town of Porto Corsa, and London, respectively) can be seen as microcosms of the film as a whole: they juggle a myriad of sets, support a number of characters and story strands, and have, as their centerpiece, exciting racing.

The opening race in Tokyo, inspired by Singapore's Formula One night

race, sets the tone for the glamorous World Grand Prix competition with the striking saturated colors and neon signage of the famous Ginza, Shibuya, and Shinjuku districts. "Having the Tokyo race take place at night lets us showcase a really rich and beautiful range of light sources, from glowing lanterns to the amazing neon signs downtown to the chaos of light reflecting on the cars themselves," says Calahan.

John Lee, Digital, 2009.

Tokyo Race Pits, **Nat McLaughlin**, Digital, 2010.

Punctuating and providing contrast to the city's high-octane modern elements are examples of the more understated and nature-based design aesthetic that typifies traditional Japanese culture, like the beautiful paper seen in lanterns, fans, and screens. "The combination we saw in Japan of beautiful traditional design and very contemporary high-concept modern design was a look that was really interesting to explore," says Jessup.

Harley Jessup, Digital, 2009.

Harley Jessup, Digital, 2009.

Harley Jessup, Digital, 2009.

Tim Evatt, Pencil/Digital, 2009.

TOKYO STYLE

John Lasseter, **Harley Jessup**, **Sharon Calahan,** Photographs, 2009.

"On our research trip to Tokyo, we actually drove the proposed racing route—which at the time included a leg out near Mount Fuji—so we could photograph all the details along the way and get them as accurate as possible. People must've thought we were crazy, taking pictures of building materials and road signs and plants on the side of the road, but when you're trying to capture the look and feel of a place, it's just as much about including the details as it is about getting the landmarks."

—BERT BERRY, shading art director

KABUKI THEATER

Tim Evatt, Pencil/Digital, 2009.

Jennifer Chang, Digital, 2010.

Jack Chang, Digital paint over character render, 2010.

SUMO ARENA
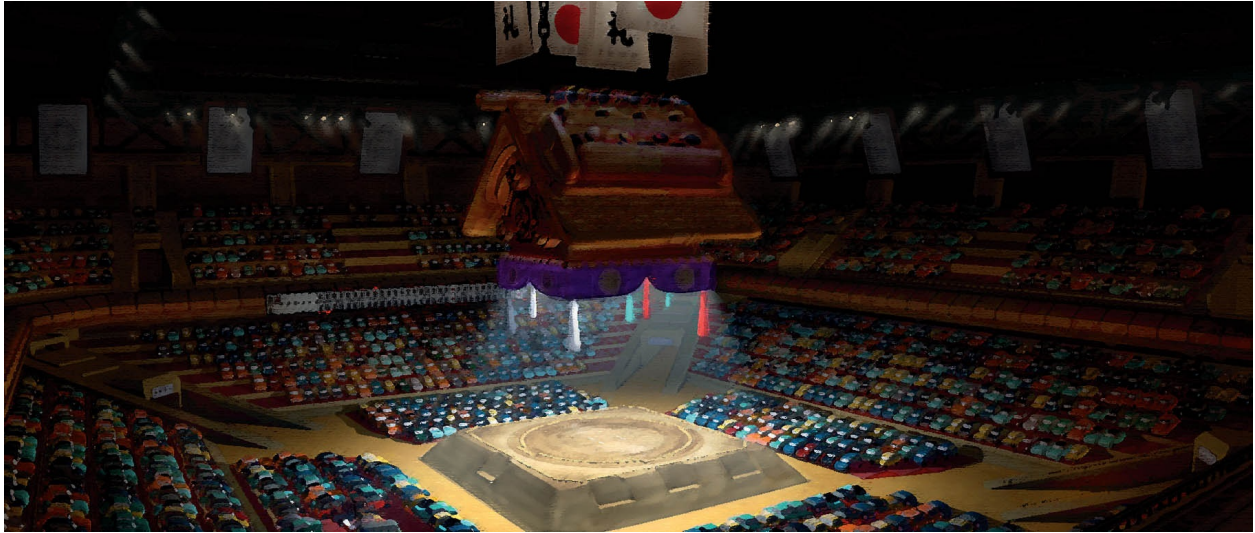
Lighting Study, **Sharon Calahan**, Digital paint over set render, 2009.

"Mater's never been out of Radiator Springs, so we get to discover this world along with him and see it through his eyes."

—JOHN LASSETER

Storyboard, **Scott Morse**, Digital, 2009.
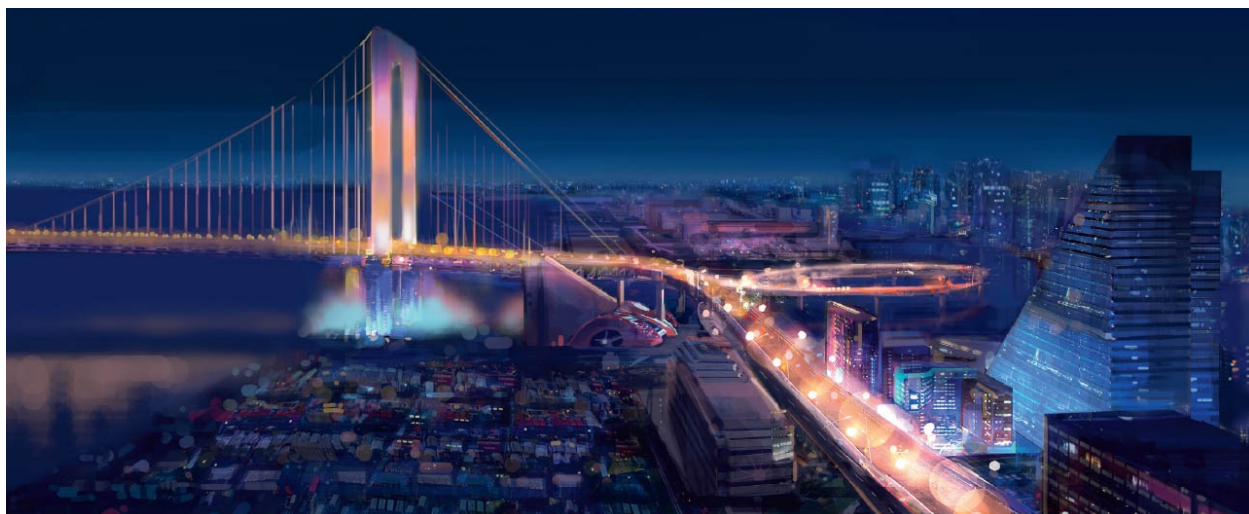
Alejandro Leon, Digital, 2009.
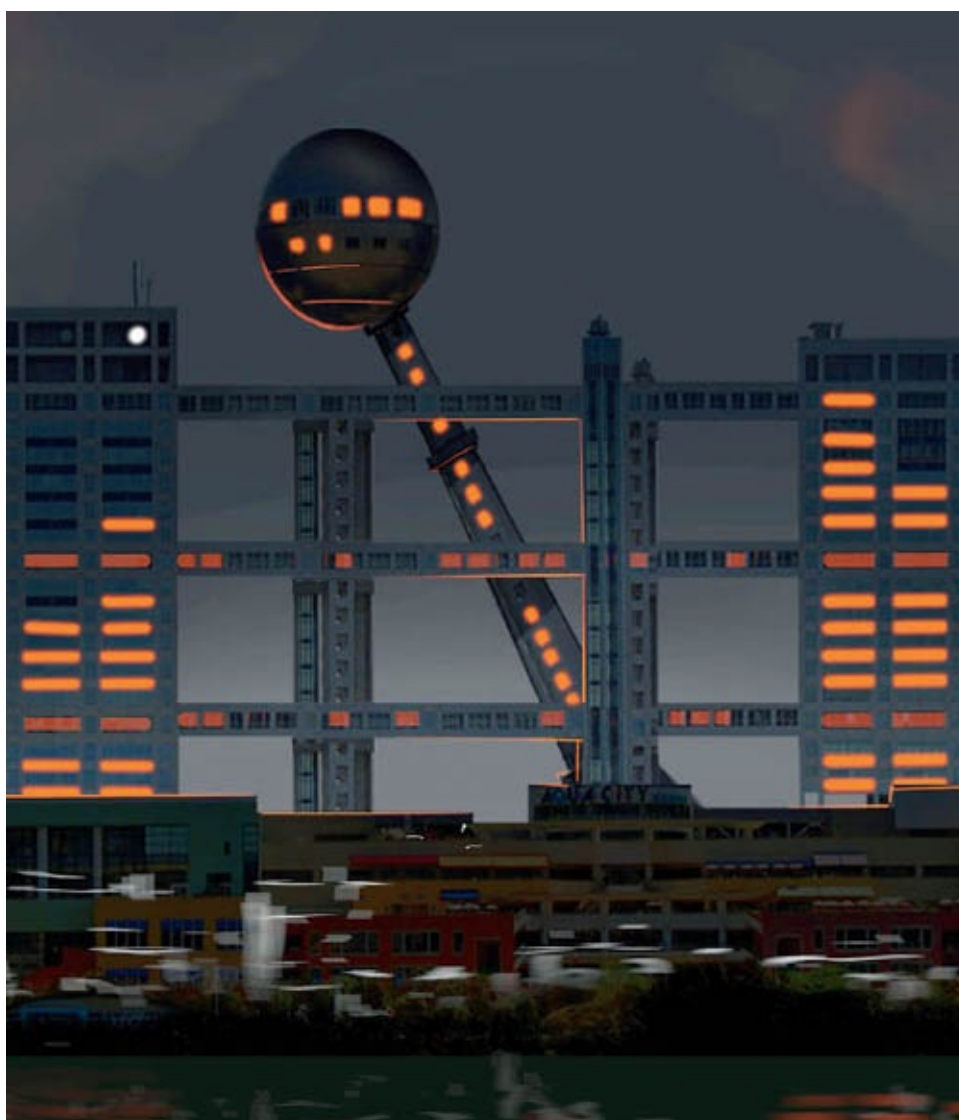
John Nevarez, Digital, 2009.

John Nevarez, Digital, 2009.

RAINBOW BRIDGE

Kristian Norelius, Pencil/Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.
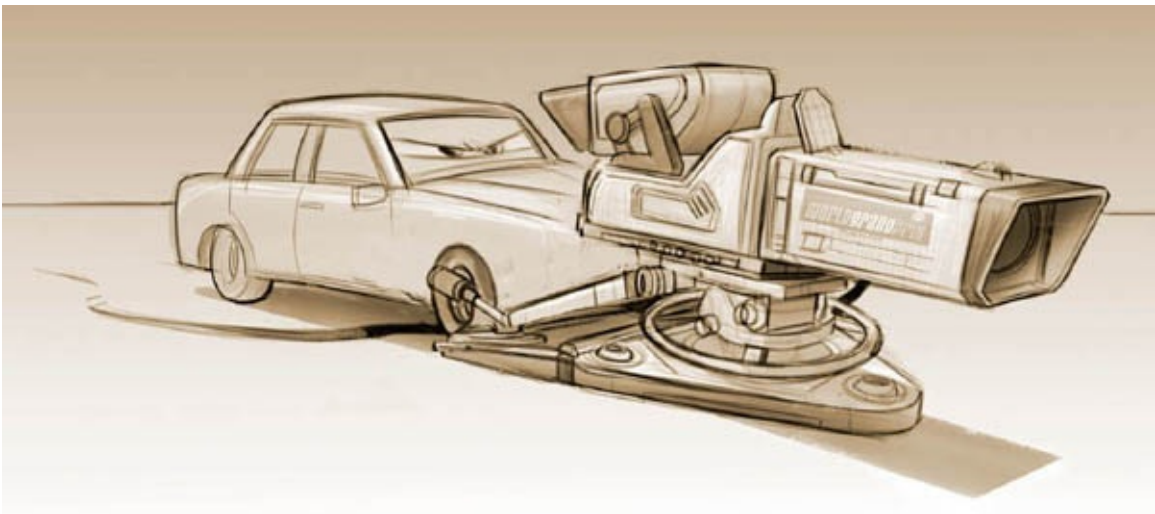
Tim Evatt, Pencil/Digital, 2010.
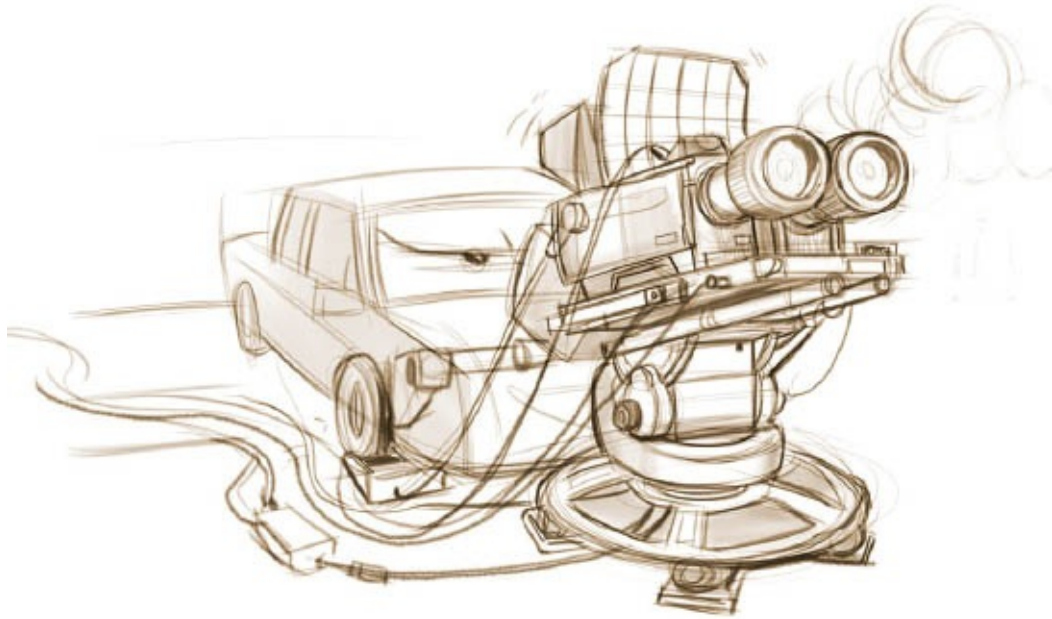
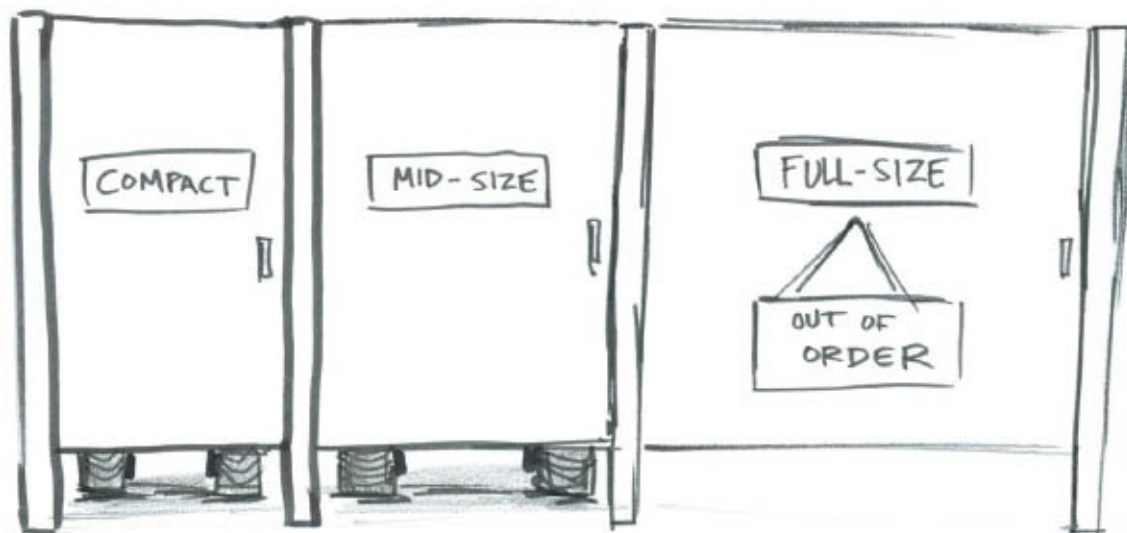**Tim Evatt**, Pencil/Digital, 2010.

Tim Evatt, Pencil/Digital, 2010.

Armand Baltazar, Digital, 2009.

"The fact that the Lemons' lair is a recycling center lends sinister implications to a movie where cars are the main characters. You see smashed car bodies stacked in the background and then realize they are the skeletons of once-living characters."

—*HARLEY JESSUP, production designer*
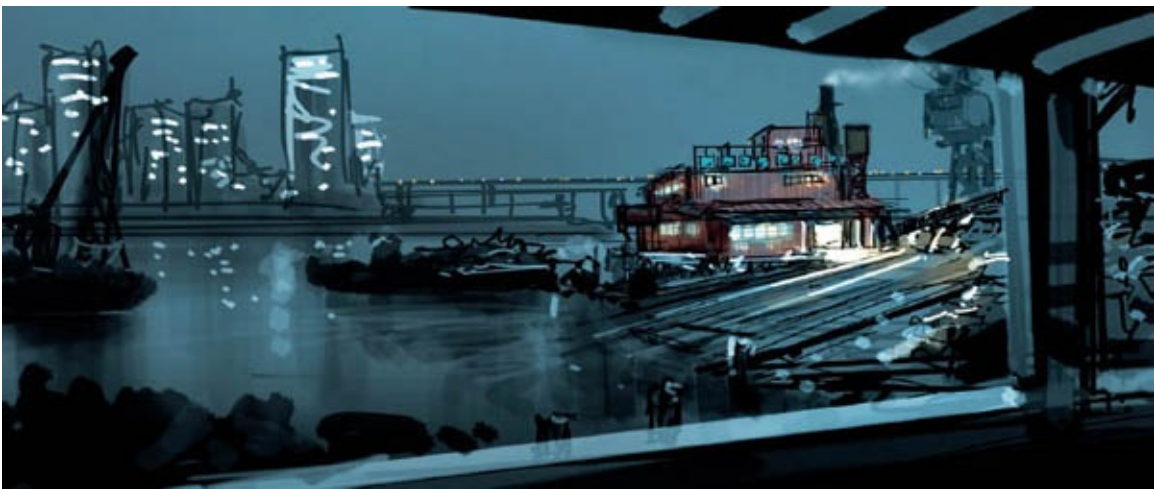
Armand Baltazar, Digital, 2010.

Nat McLaughlin, Digital, 2010.

Tim Evatt, Digital, 2010.
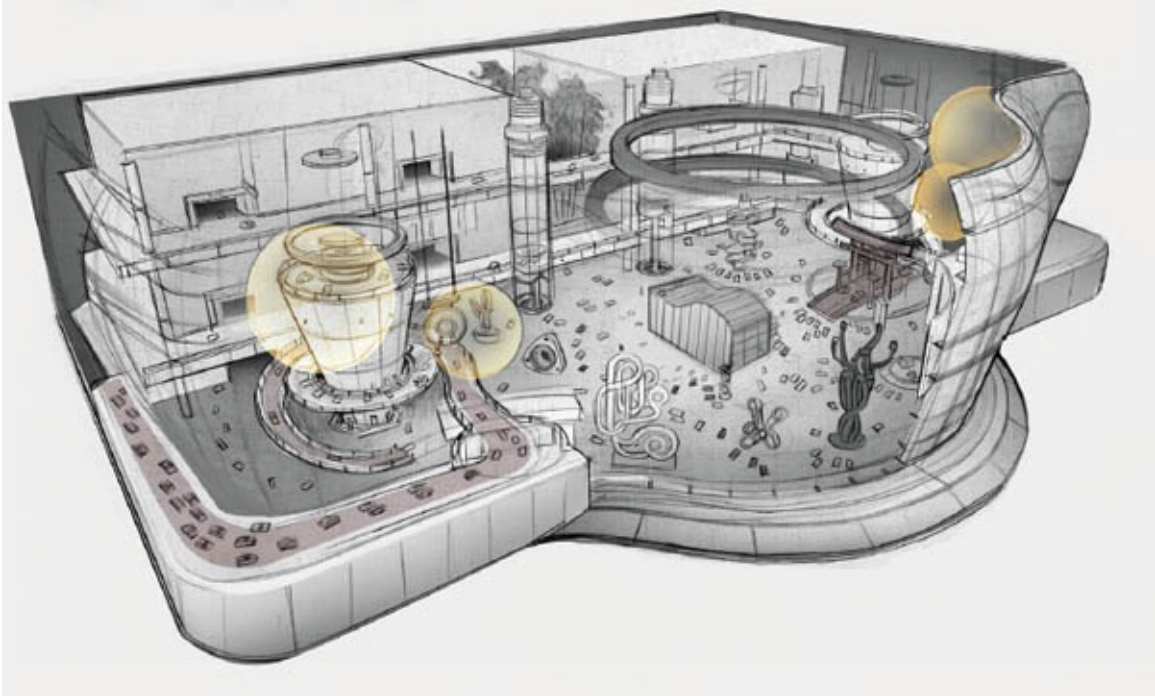
Model Packet, **Tim Evatt**, Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

John Lee, Digital, 2010.

Tim Evatt, Pencil/Digital, 2010.
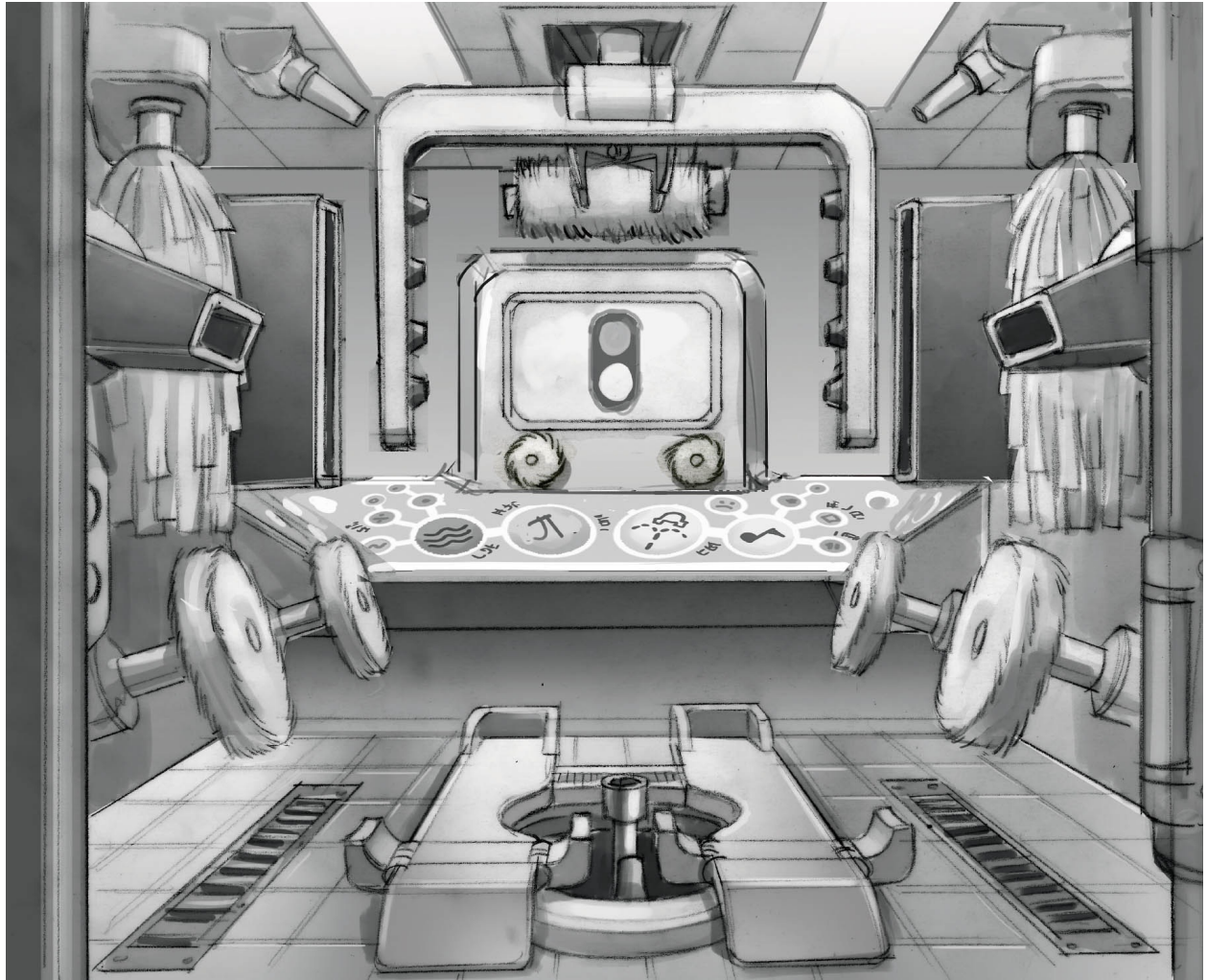
Nat McLaughlin, Pencil/Digital, 2009.
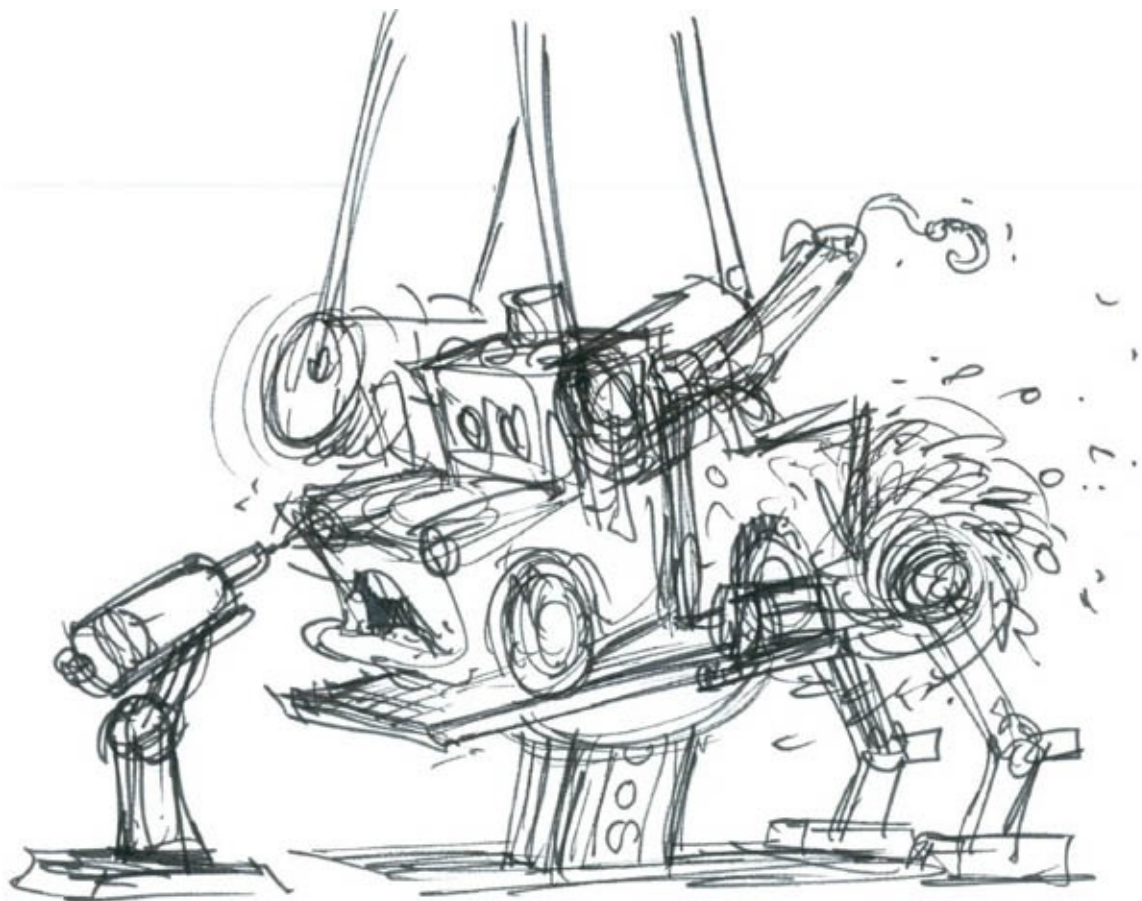
Nate Stanton, Ink, 2009.

Josh Cooley, Pencil, 2009.
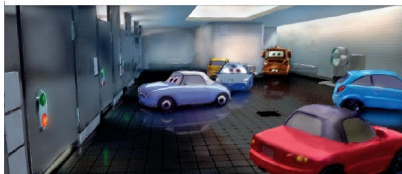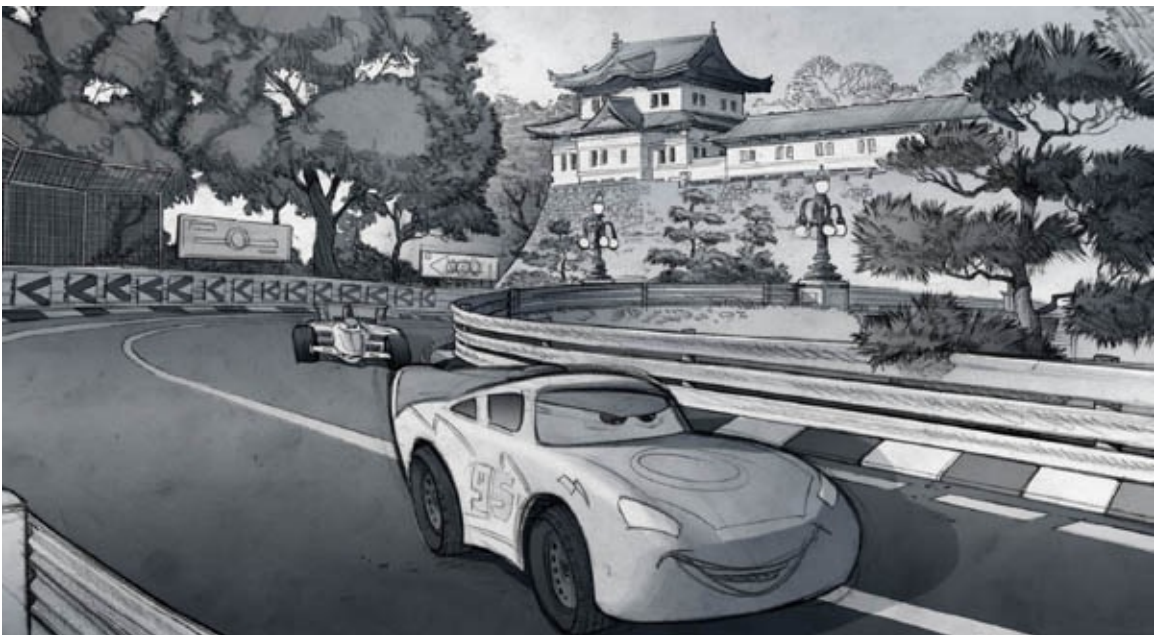
"How does a car go to the bathroom?!"

Craig Foster, Digital, 2010.
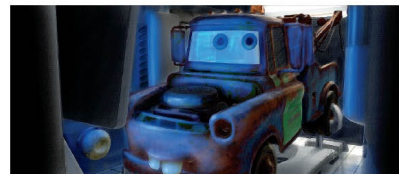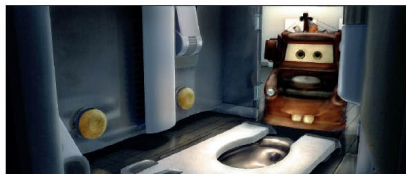
Lighting Studies, **Sharon Calahan**, Digital paint over set render, 2010.

Kristian Norelius, Pencil/Digital, 2009.

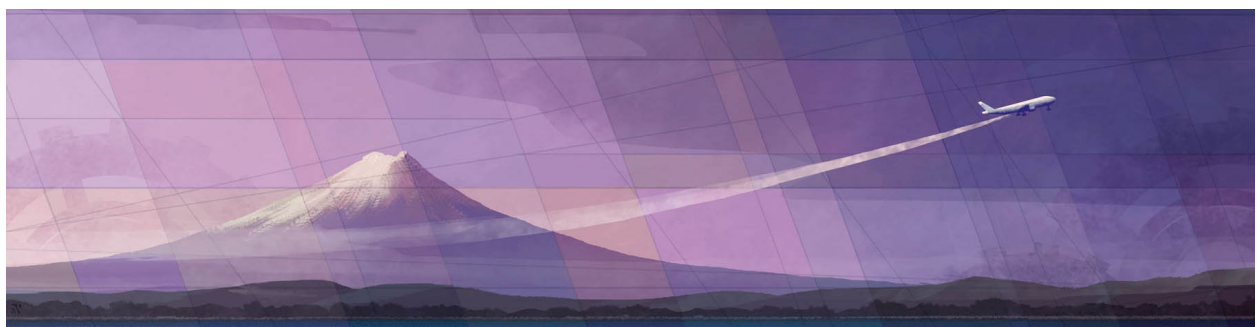**Kristian Norelius**, Pencil/Digital, 2009.

Kristian Norelius, Pencil/Digital, 2009.

Lighting Studies, **Sharon Calahan**, Digital paint over set render, 2010.

Jennifer Chang, Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"There are frequent rain showers in Japan, so we went with a wet look for the tarmac sequence in Tokyo. I love it—you get a lot of gloss and beauty from the wet surfaces in a way that's also true to the setting."

—*SHARON CALAHAN, director of photography-lighting*

Ginza Sign Graphics, **Ellen Moon Lee, Cassandra Smolcic**, Digital, 2010.

Lighting study, **Sharon Calahan**, Digital paint over set render, 2010.

SPYCRAFT

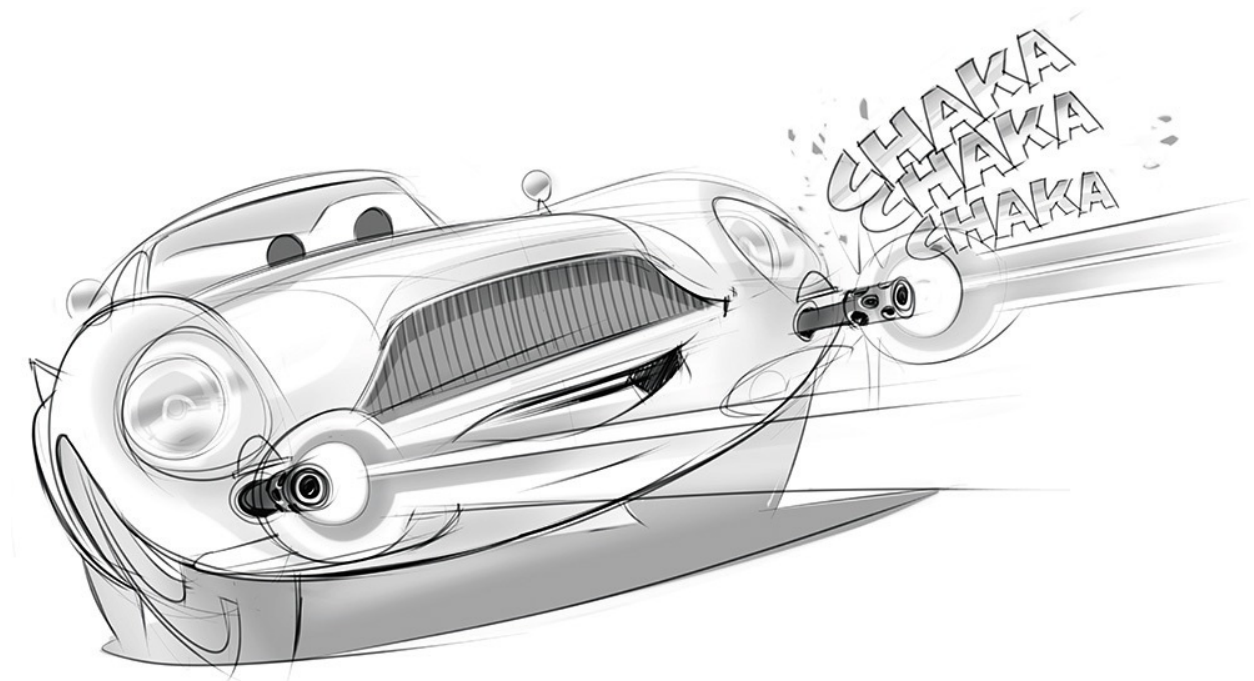Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Dan Holland, Marker/Digital, 2009.

John Lee, Pencil/Digital, 2009.

Jay Shuster, Digital, 2009.

Although Walt Disney once famously claimed to "resent the limitations of [his] own imagination," he also knew that when it comes to the creation of the world of each film, the sky can't be your only boundary. The *Cars 2* team kept this in mind from the beginning, especially when creating

the character of British spy Finn McMissile. Lasseter says, "It is so important to establish what he can do early on and set your limitations. You need to establish the rules of your world."

These self-imposed restrictions, instead of tying hands, forced the filmmakers to make better decisions. Earlier versions of the story had Finn flying and being able to retrieve any weapon when needed. But the more earthbound he became and the more limited his choice of weapons was, the more interesting and believable his character became.

Says character art director Jay Shuster: "With Finn it was important that he not explode into a Swiss Army knife. Not only must his technology reflect the time period in which he was built [the late 1960s] but everything he has on him should be structurally sound." Shuster, who comes from an industrial design background, understands the real world application of real world materials. "These are cars. You have to be truthful to their materials."

This approach to creating a character becomes a programming priority as well. Giving animators specific limits within which they need to create expressions causes them to invent ways to generate performances. Says Dave Mullins, supervising animator, "The limitation that we've put into the [Finn McMissile] AVARS [Animation Variables, or controls that pose the character] is that, if you go too close to the grille with the corner of the mouth, it just crashes in. So the animator has to back off on it. Once people get used to those limitations, it frees them up to make really unique decisions."

Then, of course, there are the thousands of limits that come with a movie where cars are the characters—something that was felt whenever Finn and Holley Shiftwell needed to do things that human spies would do. "We wanted them to have fun with the high-tech spy world, but figuring out how they could use computers was tough at first," says Lasseter. "Cars don't have fingers—how do they use a keyboard or a mouse? So we came up with these swiveling pads they could operate with their front tires. They can rotate them from side to side, roll them backwards and forwards by spinning their wheels, and click buttons by

pressing down. Watching them, you think, OK, I can buy that. I can buy a car working a computer with that interface."

Jay Shuster, Digital, 2010.

"When Finn falls off the rig and hits the water, he first transforms into a hydrofoil, then, after the bad guys fire at him, transforms into a sub and unleashes tire decoys that float to the surface to make it seem like he's been hit. Making the design elements for each moment work was all about tweaking shapes and rotation points, finessing the mechanics so the quick transformations would read from a distance."

—JAY SHUSTER

Jay Shuster, Digital, 2010.

FINN MAGNETIC TIRE

PIVOT POINT ALLOWS CLEARANCE
BETWEEN TIRE and WHEEL WELL

Jay Shuster, Digital, 2010.

HOLLEY SHIFTWELL

Jay Shuster, Color by **Jennifer Chang**, Digital, 2010.
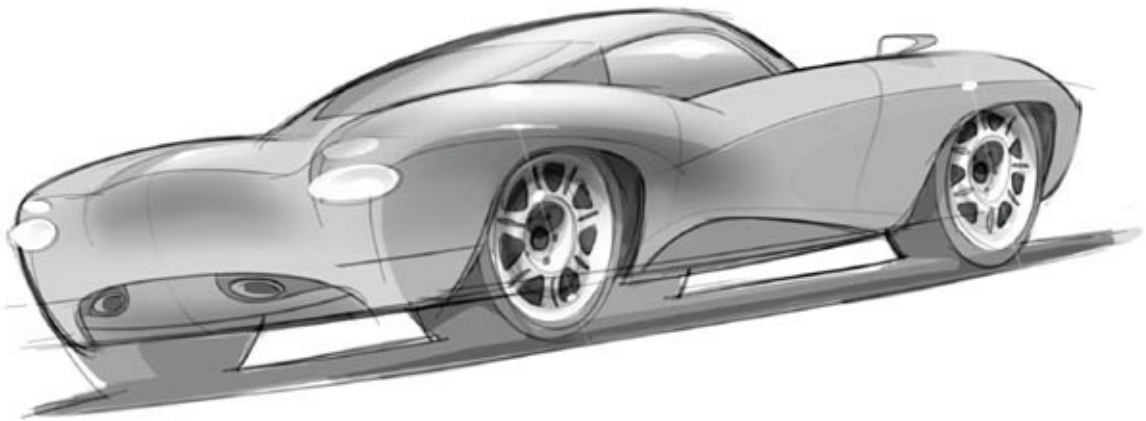
Jay Shuster, Digital, 2010.
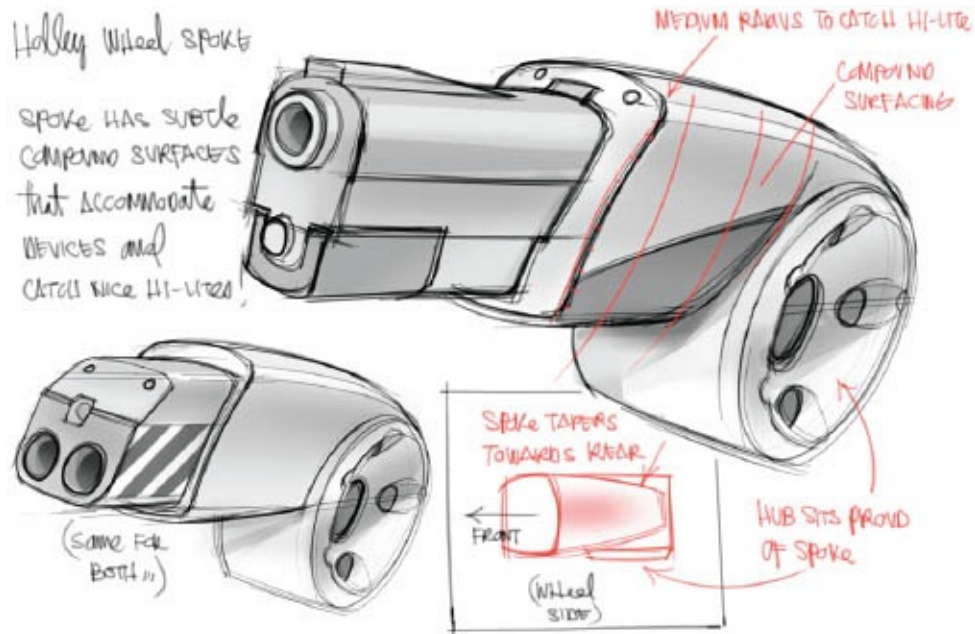
Model Packet, **Jay Shuster**, Digital, 2010.

Badge Graphics, **Ellen Moon Lee**, Digital, 2010.
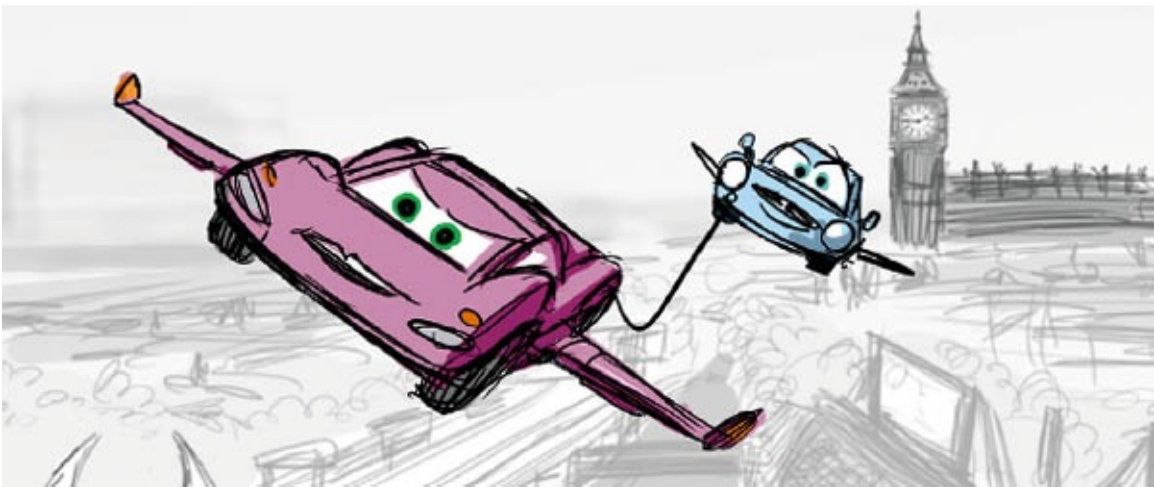
Storyboard, **Derek Thompson**, Digital, 2010.

"We wanted to have Holley be the opposite of Finn. Finn is old-school, an older car with lots of experience. So we wanted Holley to be younger and very high-tech. She's an expert with modern technology—she has a

holographic screen she can pull up, like someone who always has her laptop with her—and can infiltrate anything electronically. But she hasn't had any experience with the physical aspects of being a spy, with being in the field."
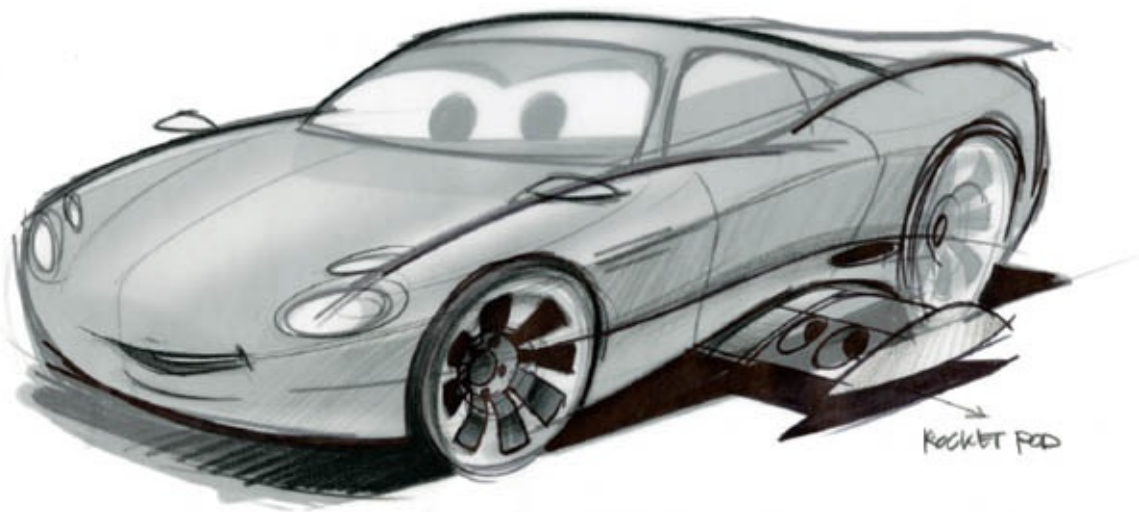
—JOHN LASSETER
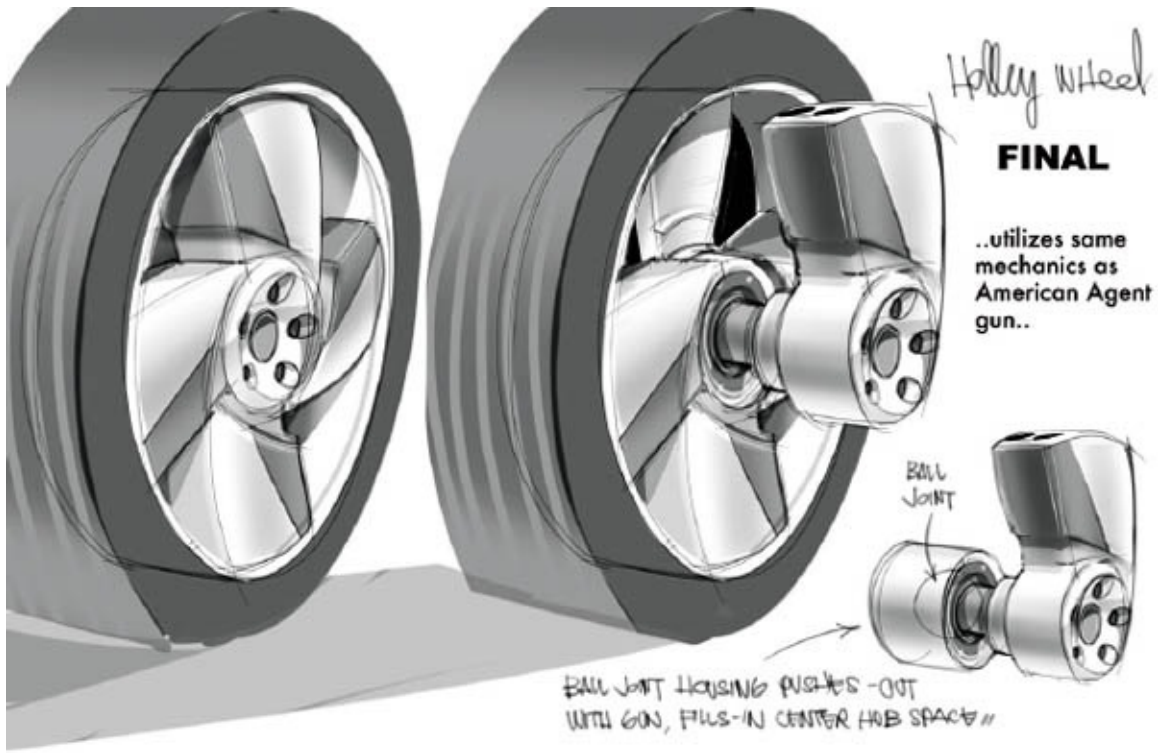
Model Packet, **Jay Shuster**, Pencil/Digital, 2010.
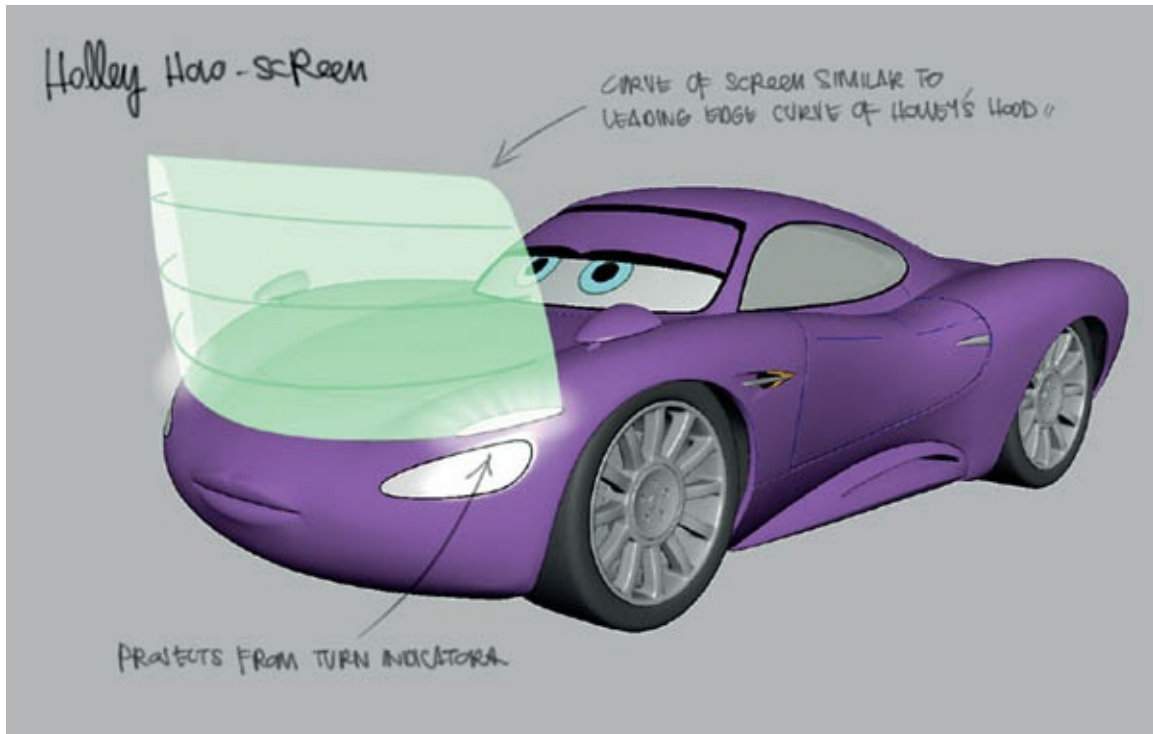
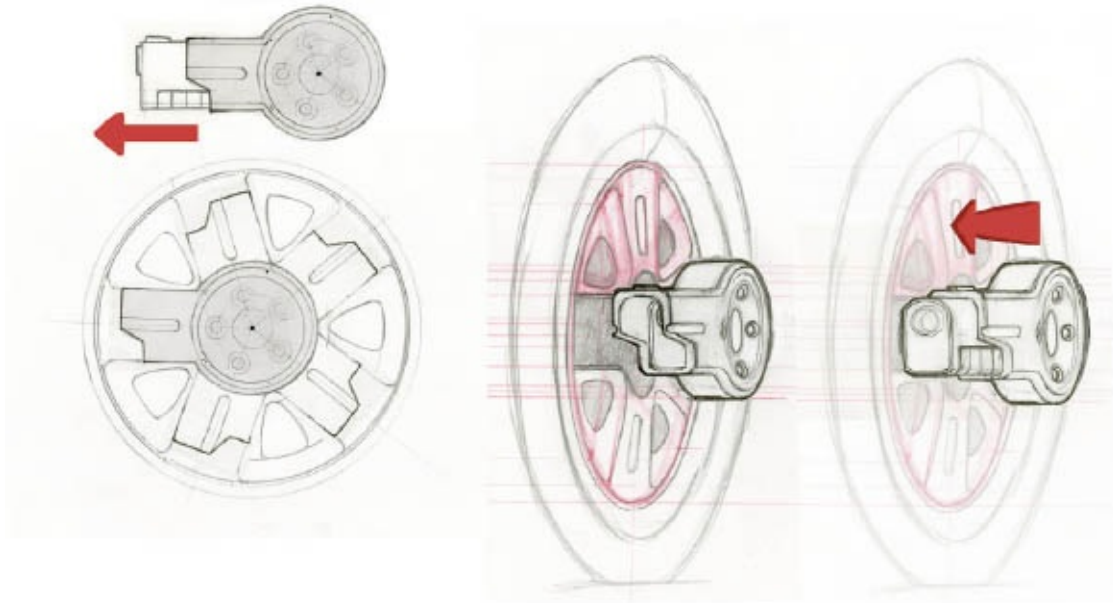Model Packet, **Jay Shuster**, Digital, 2010.
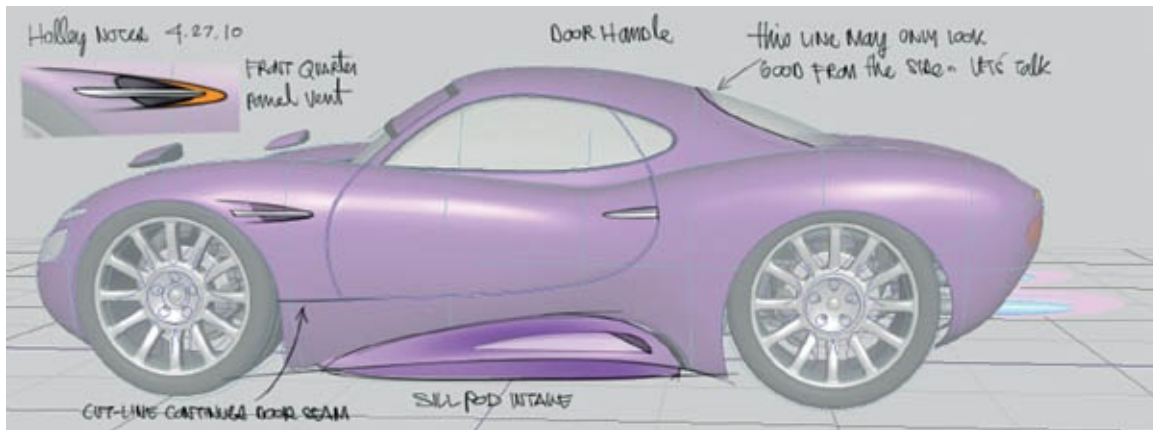
Model Packet, **Jay Shuster**, Pencil/Digital, 2010.

Jay Shuster, Pencil/Digital, 2010.
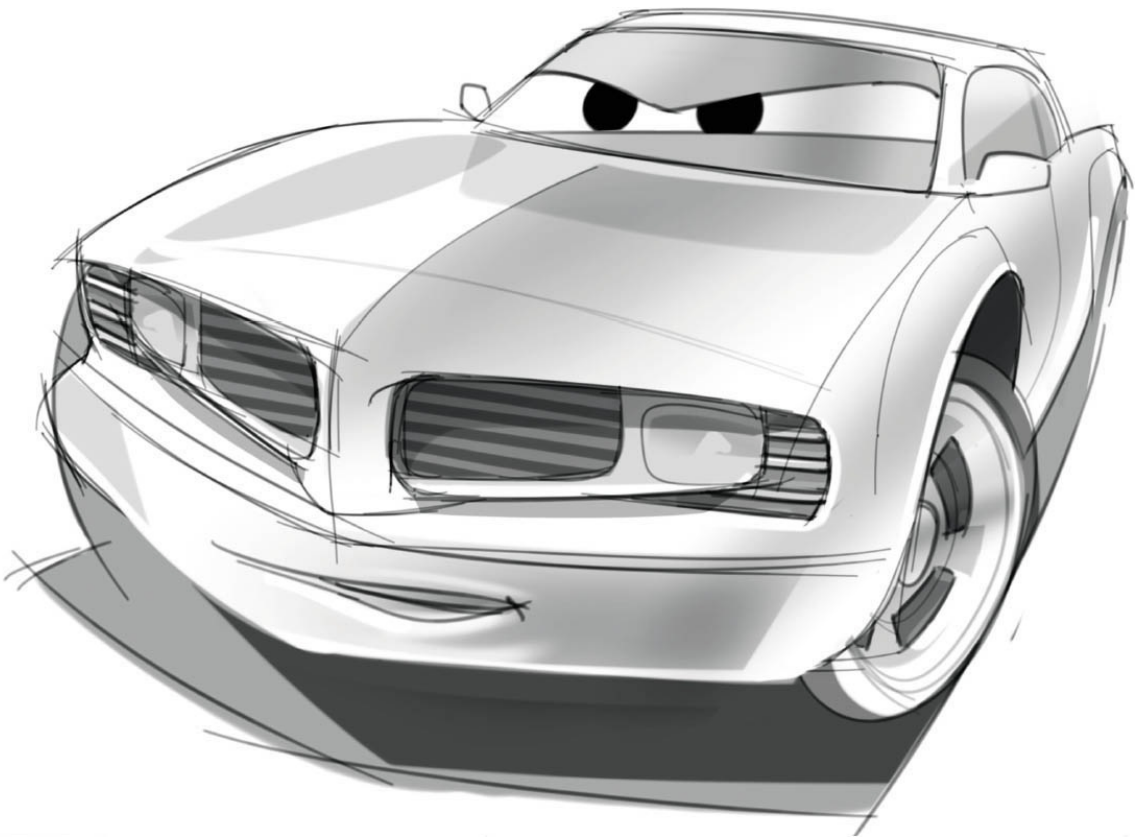
ROD REDLINE: AMERICAN AGENT

Dan Holland, Pencil/Digital, 2009.

"Rod Redline's wheel design transfigures perfectly into a gun that pops out and rotates into position. And in the Cars world, front tires are like hands, so it implies a surreptitious un-holstering of a gun."
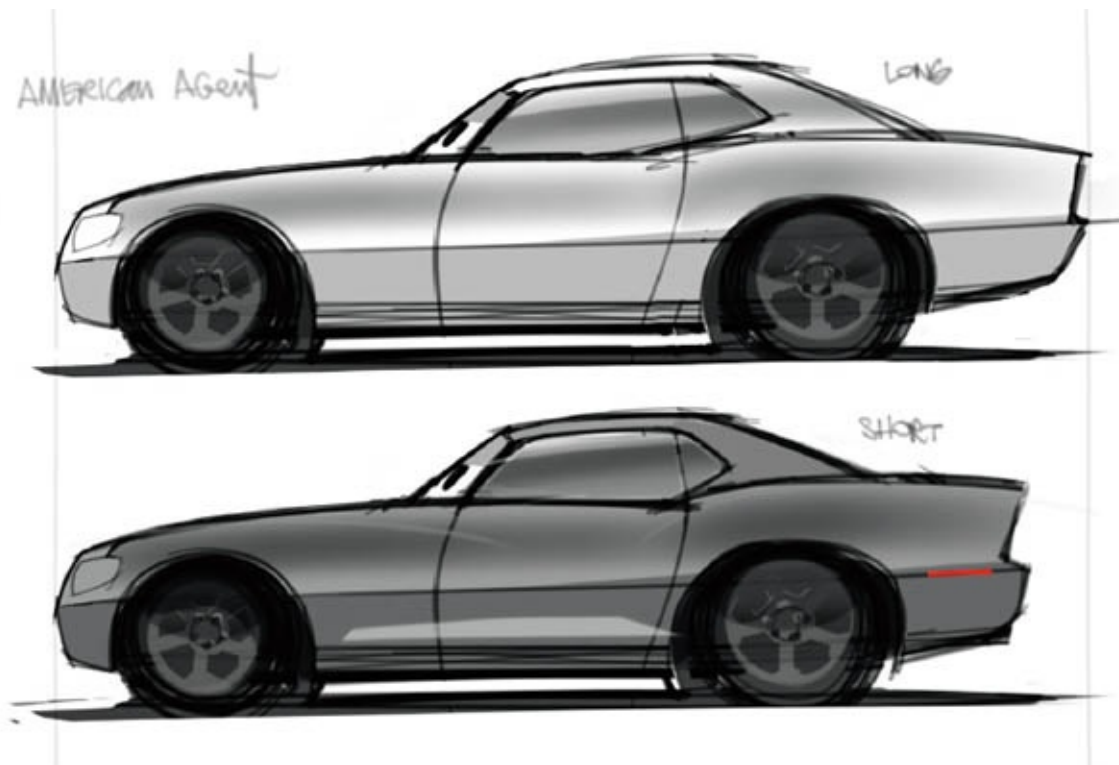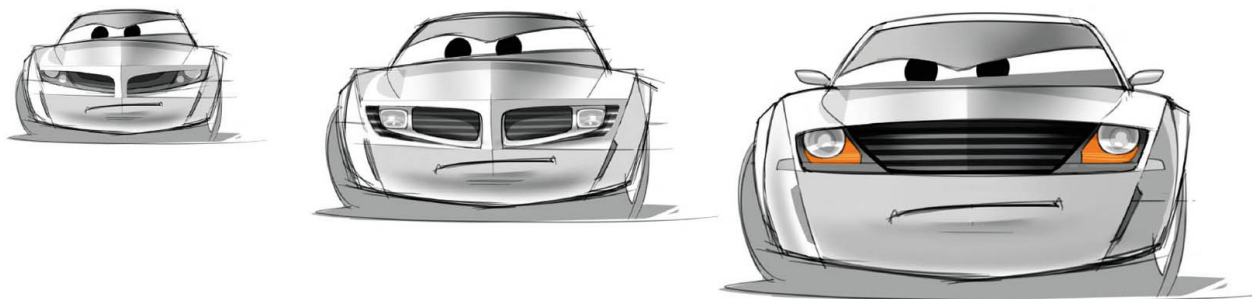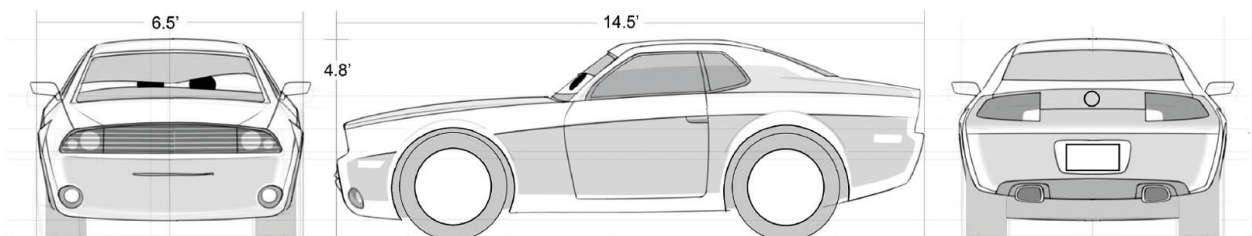
—*BRAD LEWIS, co-director*

Jay Shuster, Digital, 2009.

Jay Shuster, Digital, 2009.
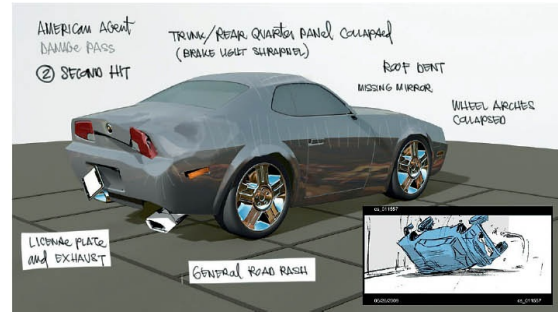
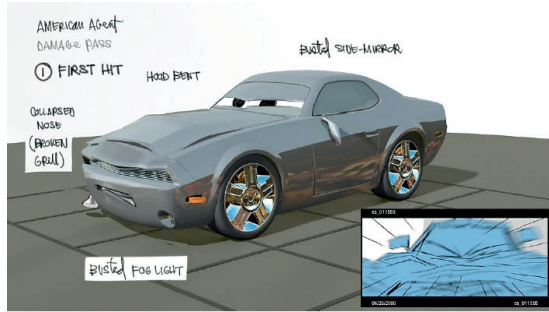**Jay Shuster**, Digital, 2009.

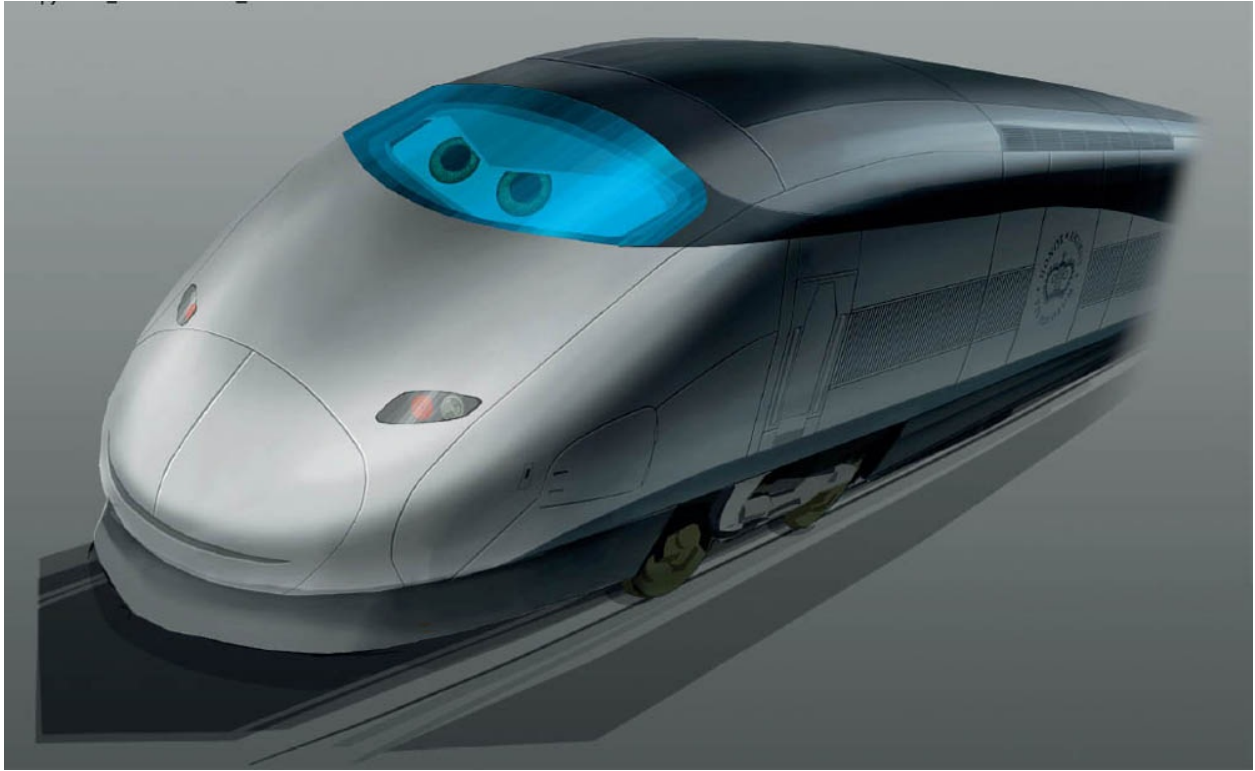**Jay Shuster**, Digital, 2009.

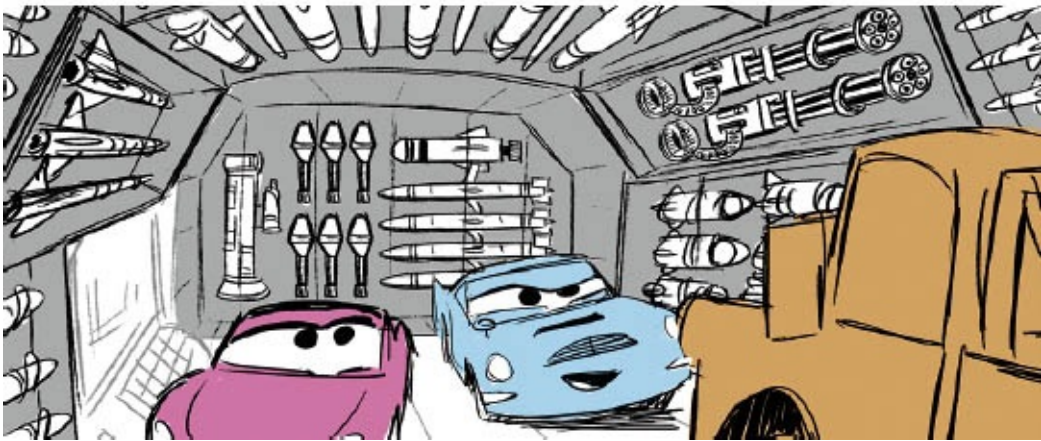Model Packet, **Jay Shuster**, Digital, 2009.

Model Packet, **Jay Shuster**, Storyboards by **Josh Cooley**, Digital, 2009.

STEPHENSON: SPY TRAIN

Jay Shuster, Color by **Jennifer Chang**, Digital, 2010.
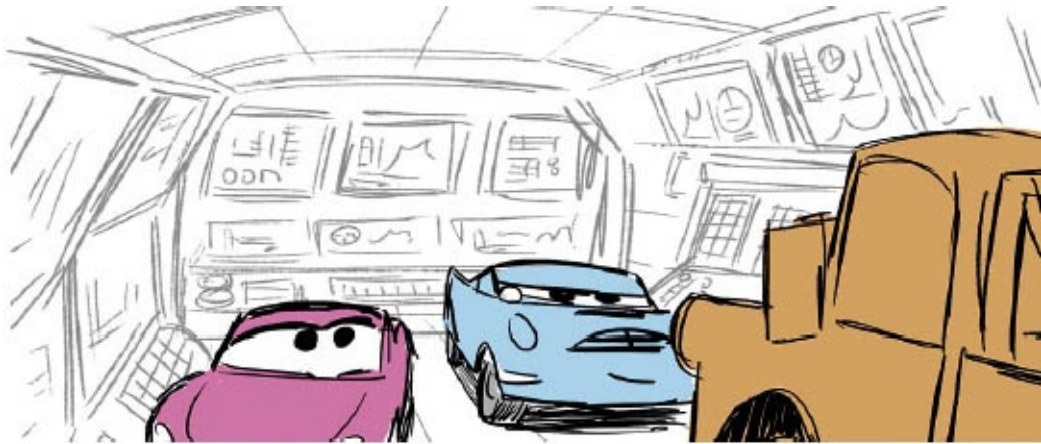
Storyboards, **Josh Cooley**, **Alex Woo**, Digital, 2010.

Bert Berry, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.
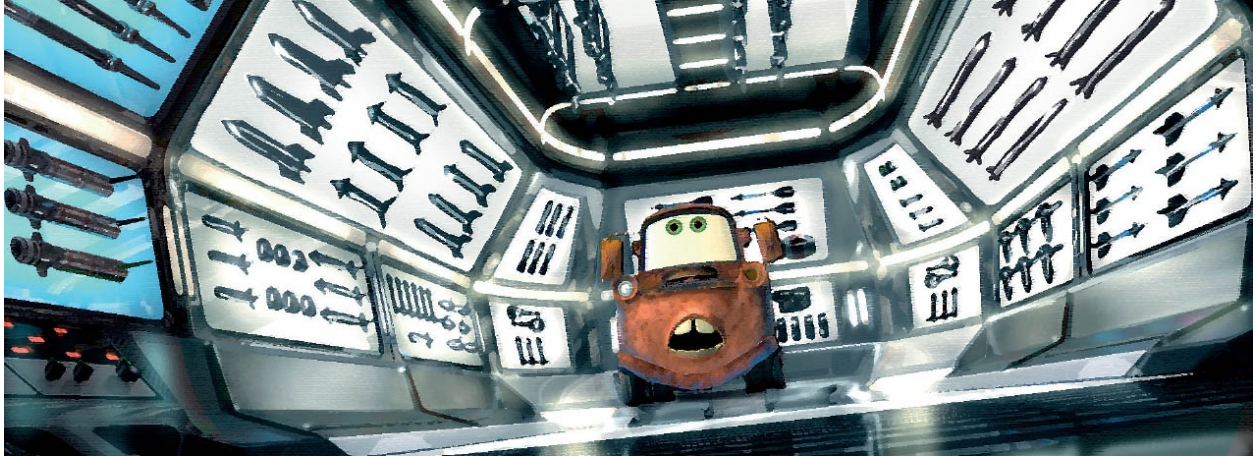
Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.
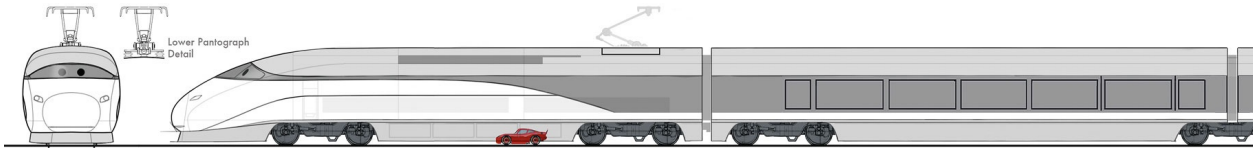
Model Packet, **Jay Shuster**, Digital, 2010.

MATER TRANSFORMATIONS

Funny Car, **Jack Chang**, Digital paint over character render, 2010.

Kabuki Mater, **Jack Chang**, Digital paint over character render, 2010.

Monster Truck, **Jack Chang**, Digital paint over character render, 2010.

Taco Truck, **Jack Chang**, Digital paint over character render, 2010.

Ivan Disguise, **Jack Chang**, Digital paint over character render, 2010.

Lunatic Mater, **Jay Shuster**, Digital paint over character render, 2010.

Harley Jessup, Pencil, 2009.

"In the middle of the movie, Mater, who's been mistaken for a real spy, gets outfitted with all these weapons and spy gadgets. Half the fun, of course, is seeing him misuse all this sophisticated technology."

—*NATE STANTON, head of story*
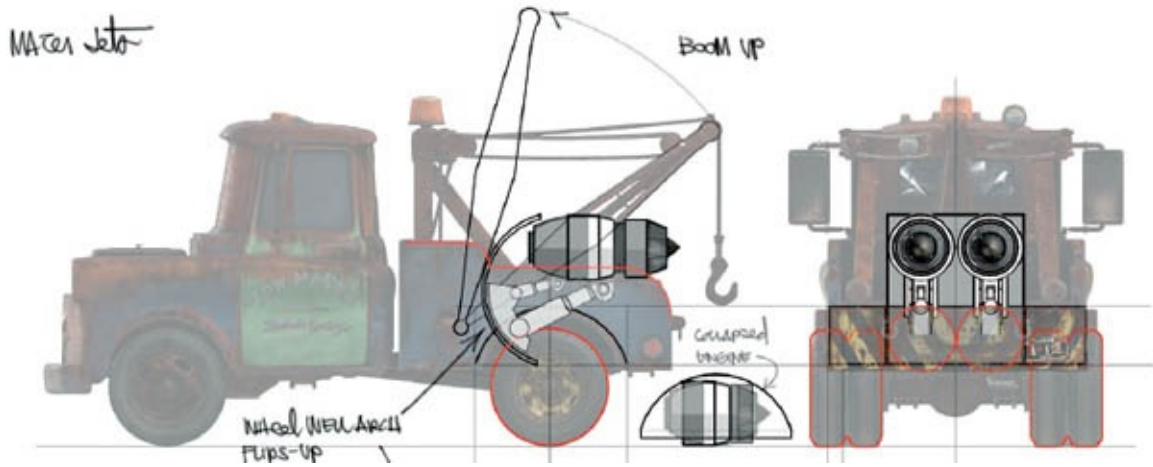
Model Packet, **Jay Shuster**, Digital, 2010.

SIDDELEY: SPY JET

Secret Service Emblem, **Ellen Moon Lee**, Digital, 2009.
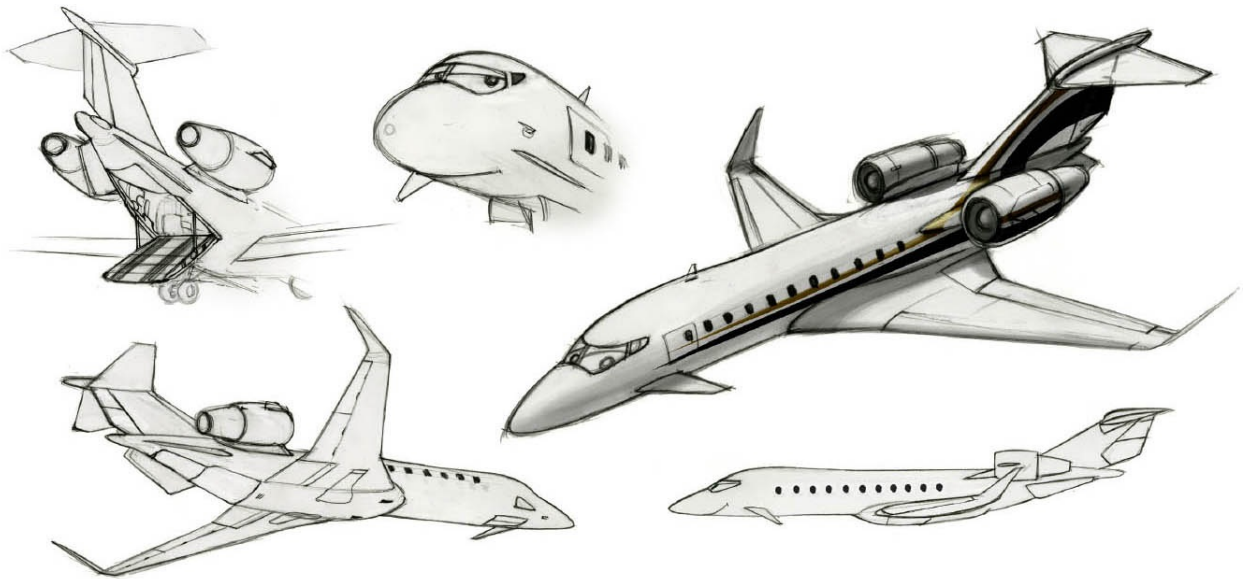
**John Lee**, Pencil/Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

PARIS

Armand Baltazar, Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

A twenty-four-hour endurance race through Paris was one of two racing sequences (along with a rally race in Germany's Black Forest) that were conceived, designed, and later jettisoned over the course of the story development process. But unlike Germany, which would ultimately not appear in the final version, the City of Light found its way back into the film. Rather than being used as glittery, gorgeous, travelogue-style scenery, the city would serve instead as the backdrop for one of the darkest, grittiest scenes in the film.

A tense, *French Connection*–inspired chase, followed by the questioning of a black-market parts dealer, was written and boarded. For the setting —a covered bazaar populated by a number of auto-parts vendors— Lasseter suggested that Jessup take a look at old photographs of Paris's Les Halles marketplace. Jessup wouldn't have to look very far to find them. He had already researched the famous central market—which was demolished in 1971—while working on a scene for another Pixar movie, *Ratatouille*. Ironically, the scene, in which Remy the rat shops for food in a Les Halles–inspired market, was, like *Cars 2*'s Paris racing sequence, also discarded.

"This is how things work sometimes at Pixar," says Nate Stanton. "Things fall away. But the really good ideas will stick around forever. Some ideas that drop out in the beginning can come back, full circle, and sprout in a different way." (*Toy Story 3*'s Lots-o-Huggin' Bear—a character originally discussed as a possibility for the first film—is Pixar's most memorable recent example.) Says Nat McLaughlin about the look of the resulting scene, "It's moody and decrepit, and you've got these slatted windows with old yellowed panes of glass in them that you can shoot filtered light through. There are lots and lots of vendors selling stuff like car parts that are reminiscent of sides of beef. It's disturbing. And cool."

Kristian Norelius, Pencil/Digital, 2010.

PARIS STYLE

Harley Jessup, Photographs, 2009.

"Visiting Paris for the first time, what struck me was how beautiful and well preserved the city was. Nearly everything from the landscaping to the signage seemed to be carefully designed to support this classical beauty, and I knew that achieving this look would be crucial for the film. We took a whirlwind motorcycle tour through the city, stopping for a few minutes at each point of interest to walk around and take photos. It was a great way to get a feel for the city and the uniquely preserved classical architecture that we would later 'car-ify' with various automotive motifs."

—NAT McLAUGHLIN, *environments art director*

TOMBER

Jay Shuster, Digital, 2009.
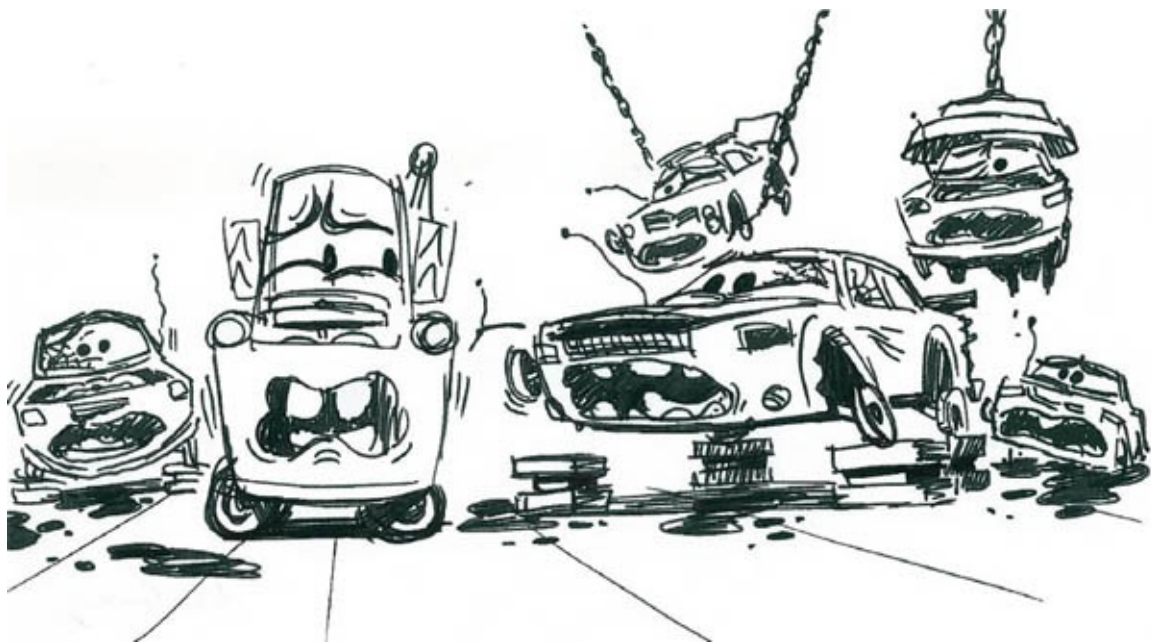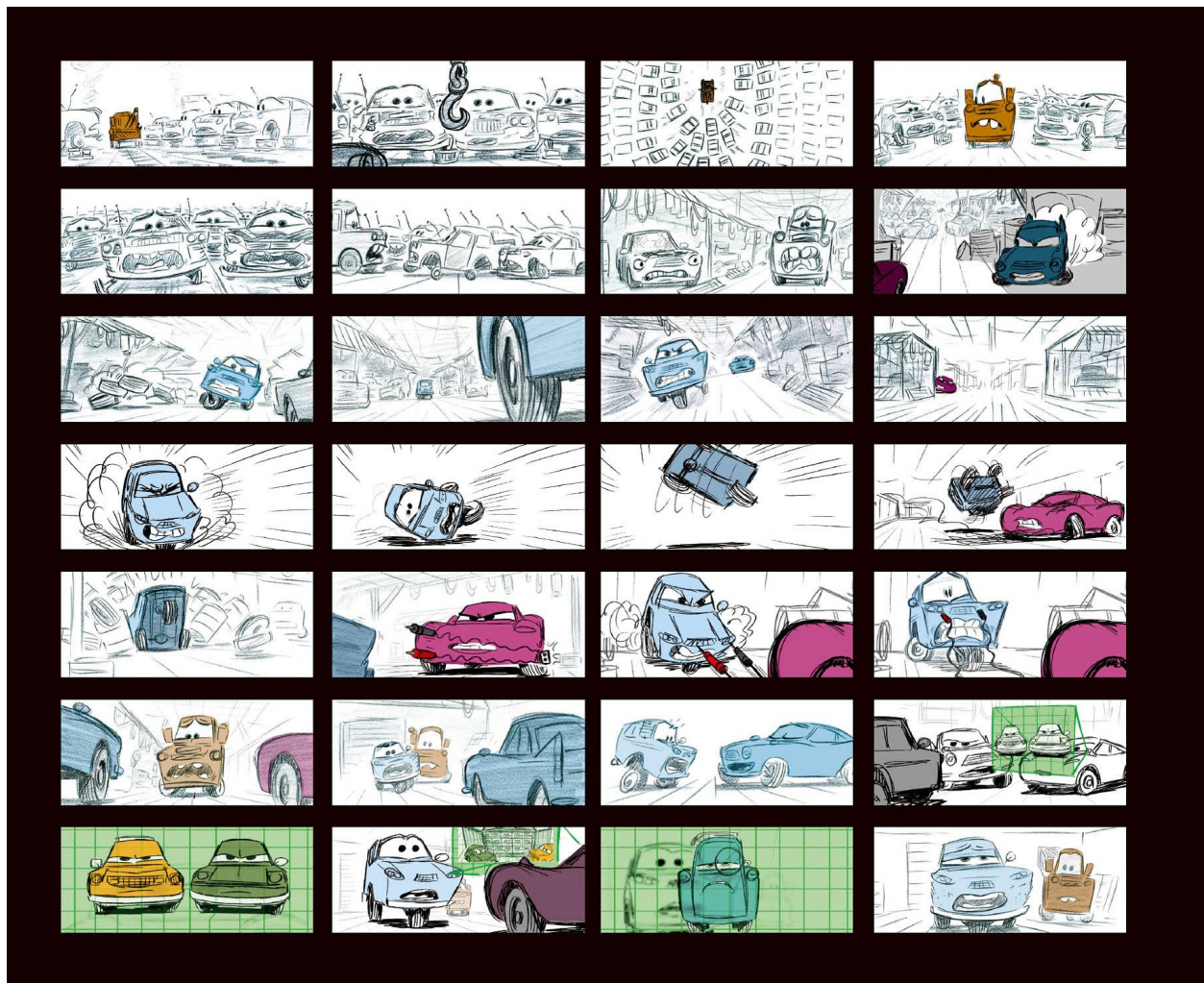
Dan Holland, Marker/Digital, 2009.

Jay Shuster, Digital, 2009.

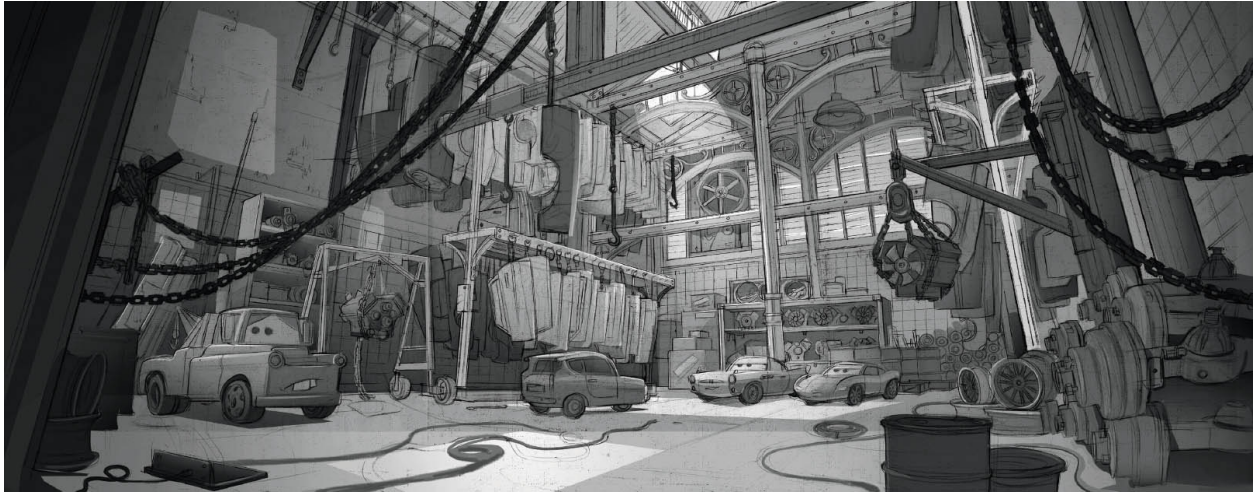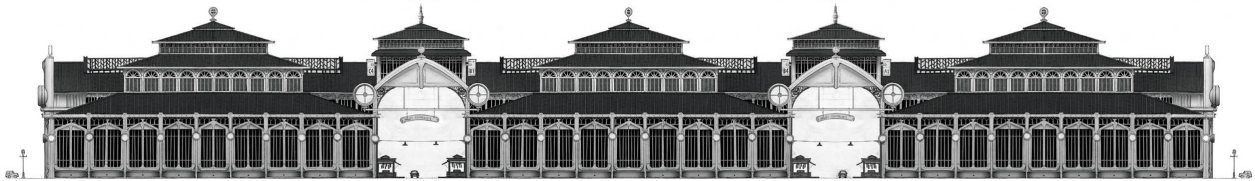**Josh Cooley,** Ink, 2010.
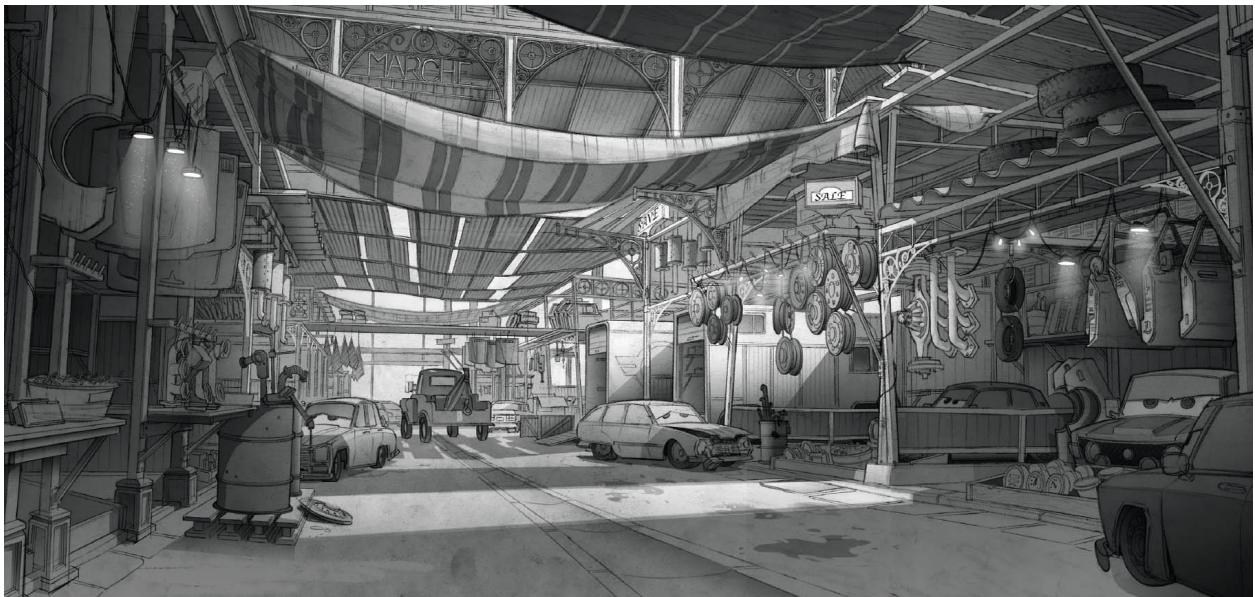
Storyboards, **Josh Cooley,** Pencil/Digital, 2010.

PARIS MARKET

Tim Evatt, Pencil/Digital, 2010.

Model Packet, **Kristian Norelius**, Pencil/Digital, 2010.

Kristian Norelius, Nat McLaughlin, Pencil/Digital, 2010.

Armand Baltazar, Digital, 2009.
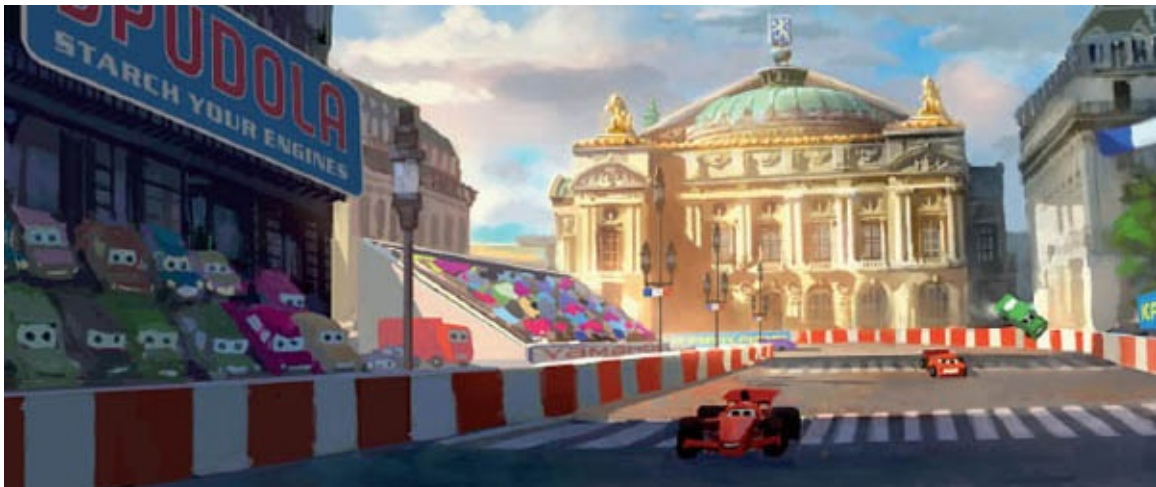
Armand Baltazar, Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over render, 2010.

"In each country, as we designed the background cars, Harley [Jessup] definitely encouraged us to skew things more vintage, to feature classic cars from each country. So in Paris you'll see the time-honored Citroen DS, the 2CV, and the old Renaults mixed with modern French designs."

—JAY SHUSTER
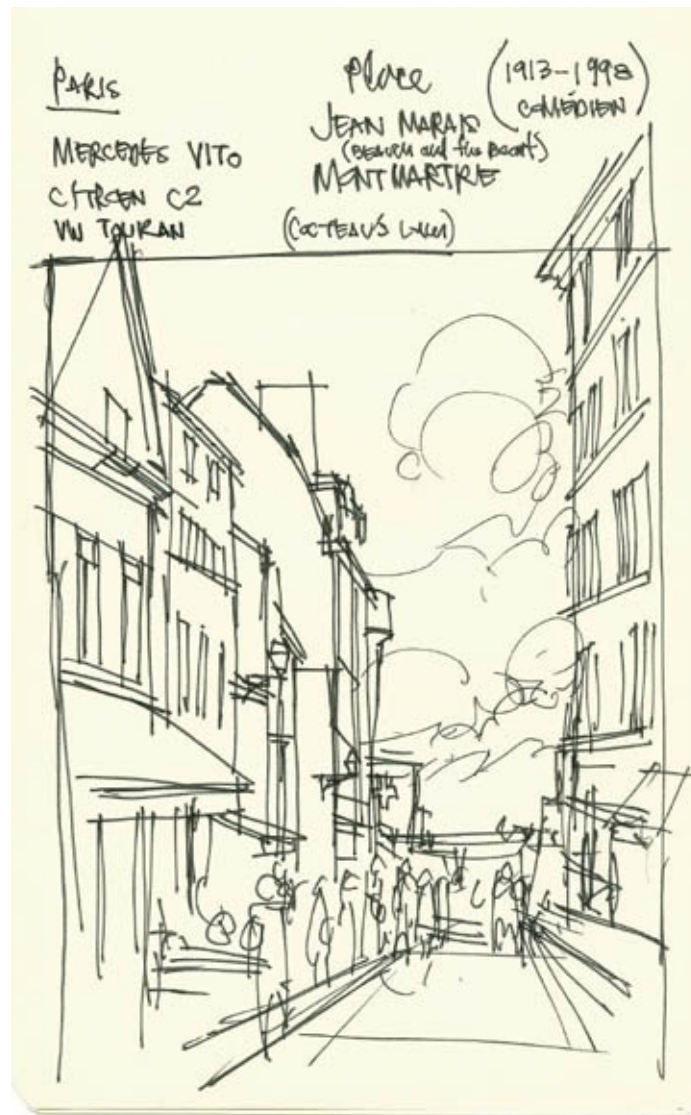
Jay Shuster, Pen/Ink, 2009.

SACRE COEUR

Model Packet, **Armand Baltazar**, Digital, 2009.

LOUVRE

Model Packet, **John Nevarez**, Digital, 2009.

Color Palette for French Background Cars, **Bert Berry**, Digital, 2010.

NOTRE DAME

Model Packet, **Armand Baltazar**, Digital, 2009.

LOUVRE DETAIL

Model Packet, **John Nevarez**, Digital, 2009.
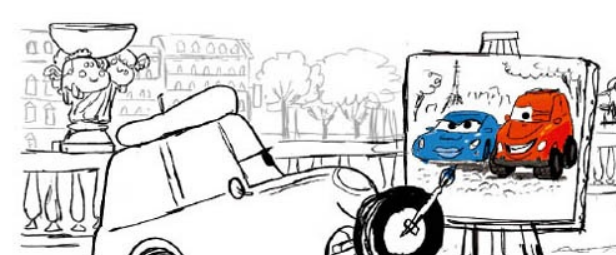
Storyboards, **Erik Benson, Josh Cooley**, Digital, 2010.

ARC DE TRIOMPHE
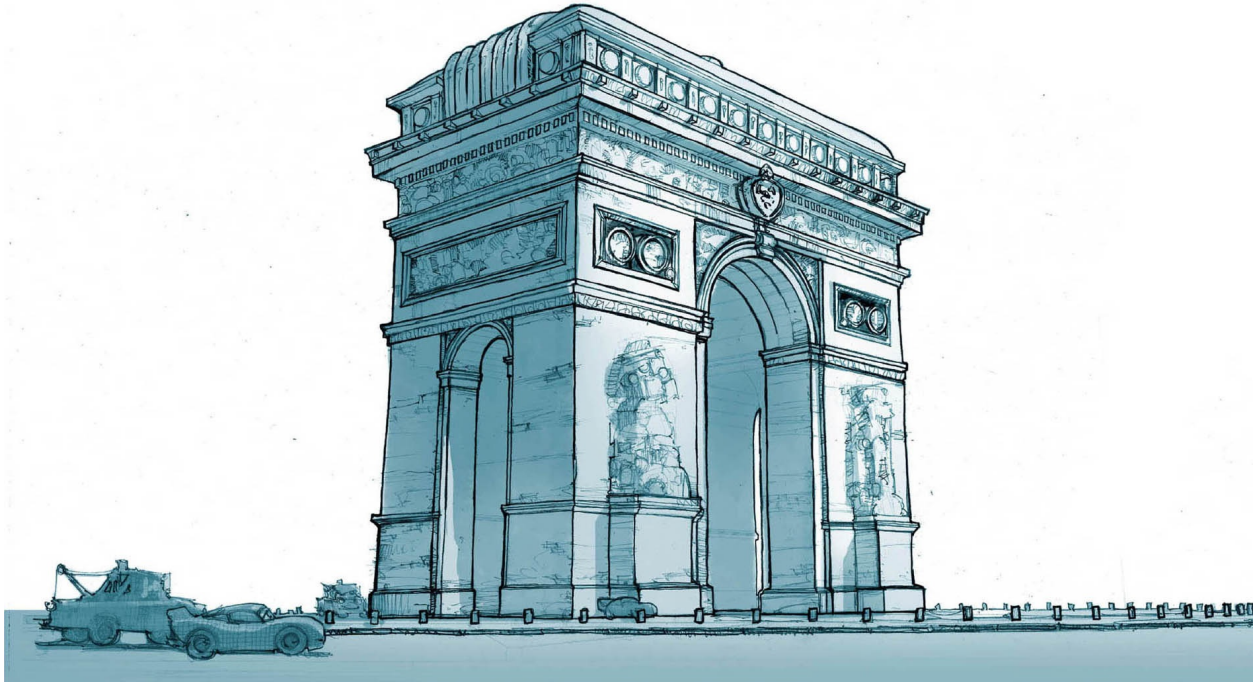
Model Packet, **Armand Baltazar**, Pencil/Digital, 2009.

PORTO CORSA

Armand Baltazar, Digital, 2010.
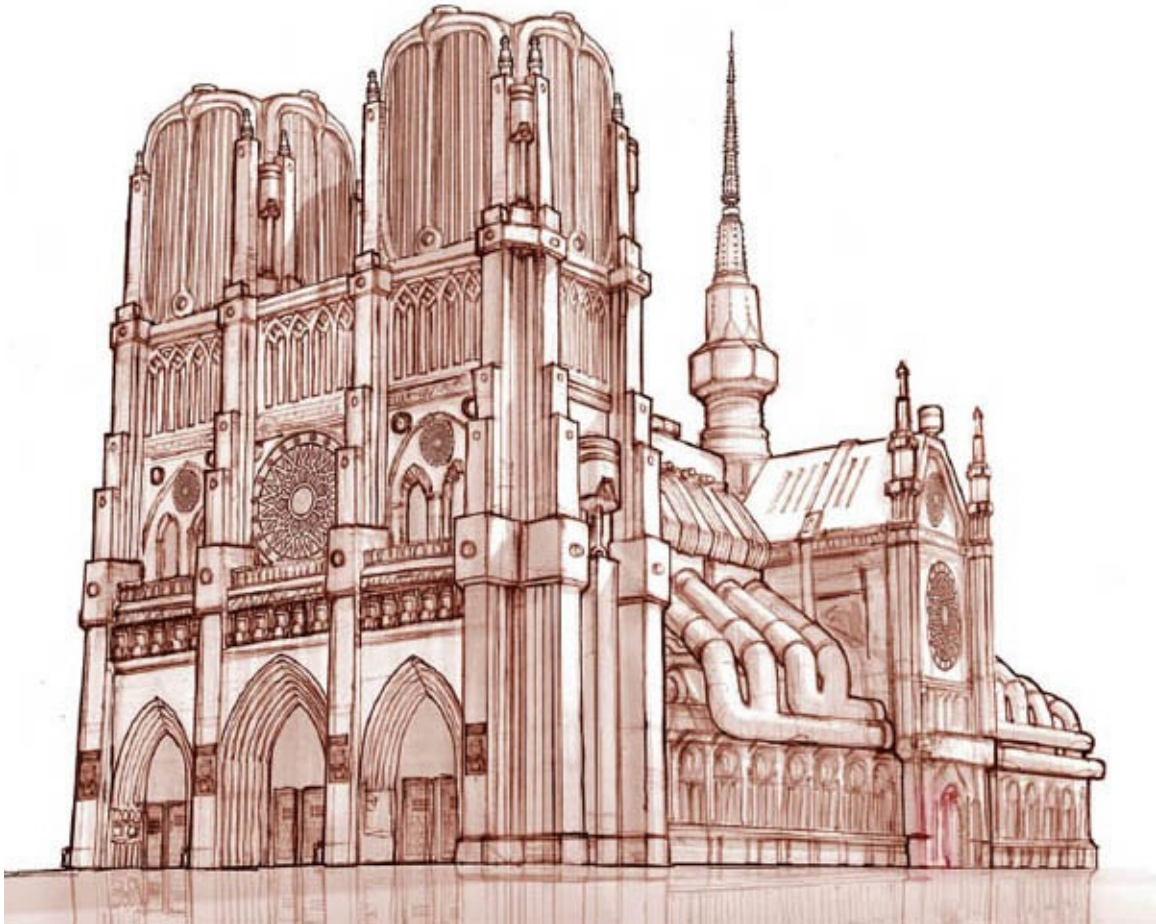

Kristian Norelius, Pencil/Digital, 2009.

Whereas the races in Tokyo and London were adapted to their cities, it was decided that for the Italian race a fictional city would be created. The move to create a location from whole cloth came from a desire to capture the spirit of European Grand Prix racing in a unique way. Says Brad Lewis, "We wanted it to be our love letter to European racing and to Italy."

The *Cars 2* art department had a ball thinking about how to devise their own Italian Riviera–style town, and a formative research trip to watch the Monaco Grand Prix gave them plenty to work with. Set designer Armand Baltazar was charged with designing a location that drew on influences from multiple cities along the Riviera. He started by looking at photographs of Vernazza, Genoa, and Positano and began sketches based on those towns. His final, skillful plan reflects the rock promontories that pepper the Cinque Terre coastline, but it also includes the grandeur of Monte Carlo's bay and a gorgeous nighttime square inspired by Portofino. Says Baltazar: "All of these things feel familiar to you as an audience member, but they don't exist together in real life."

"We made up our own Italian town, attempting to merge the classic look of the Monaco Grand Prix with the charm of Portofino," says Harley Jessup. "We used an idealized Riviera palette of turquoise water, blue skies, lush green vegetation, terra cotta rooftops, and brightly painted stucco buildings to color Porto Corsa."

For the casino—a key location in which Mater and his new spy friends infiltrate a dangerous Lemon meeting—the Riviera's strong French influence in northern Italy served as a touchstone. Jessup, in his research of the area's architecture, discovered that the designer of the Monte Carlo casino, Frenchman Charles Garnier, also designed the Paris Opera House. Garnier's influence is seen in many of the small casinos that pepper the little towns along the Riviera. As a result, Jessup and the art department wanted the casino plaza in Porto Corsa to reflect the distinctly French sensibility of Monte Carlo. "What would be stone in Paris is painted stucco on the Riviera," Jessup says. "It's a more decorative, colorful treatment of classical French architecture that looks fantastic in a sunny resort setting mixed with the traditional Italian architecture."

The final ingredient of this Riviera fantasy: weather. "Because all the races take place outdoors, skies are key to helping us feel where we are at a given moment," explains Sharon Calahan. "What the sky looks like, what the cloud forms look like, what time of day it is—all these tell you so much about your location. Porto Corsa has the beautiful weather you always expect of the Riviera, that idyllic, sun-drenched perfection."
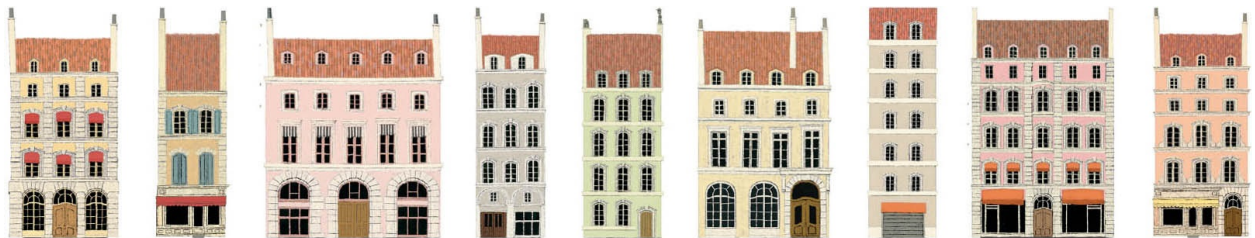
Armand Baltazar, Digital paint over set render, 2010.

Armand Baltazar, Digital paint over set render, 2010.

Shader Packet, **Bryn Imagire**, Digital, 2010.

PORTO CORSA STYLE

"One of the things that really stood out to me about Italy was the easy coexistence of the old and the new. You'd see a rustic piazza with a centuries-old fountain sharing space with an ultra-modern, gleaming new automobile —or an equally modern piece of architecture—and yet there was a thread of kinship between all the objects in the scene. There is an immediate sense that this culture embraces beauty in all of its changing and evolving forms."

—*JAY SHUSTER*

Harley Jessup, Brad Lewis, Photographs, 2009.
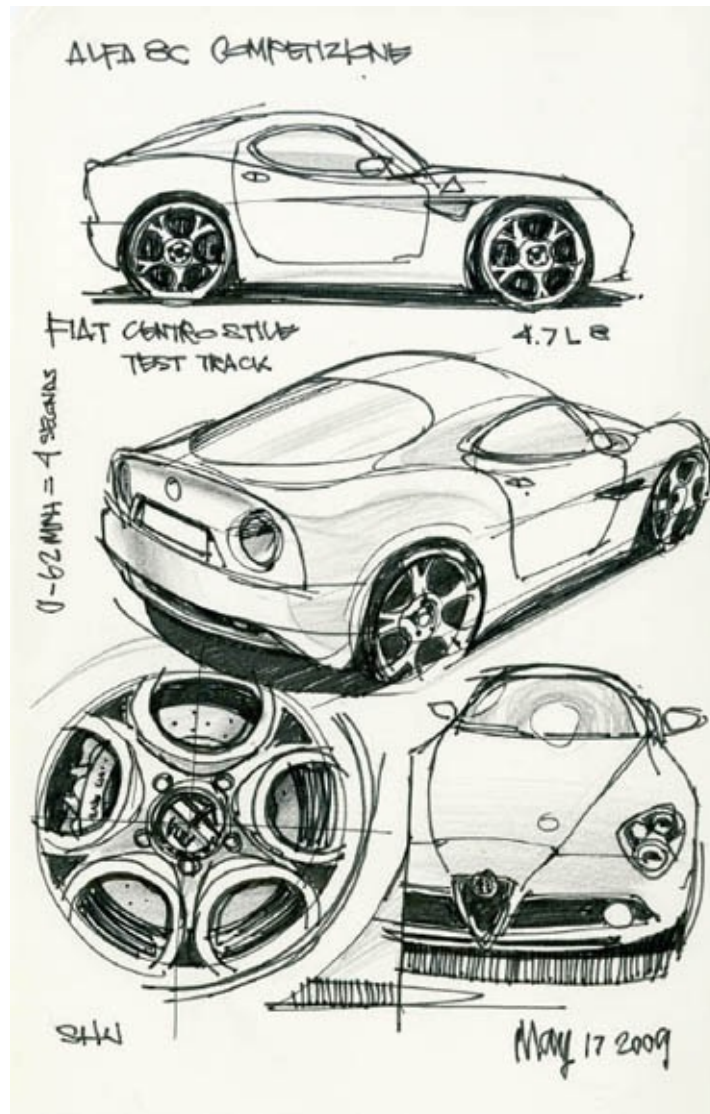
Jay Shuster, Pen/Ink, 2009.

"Inspired by Ornament Valley in Cars, we carved the shapes of classic Italian cars into the landscape. There's a Fiat Topolino sculpted in the base of the casino hill and other classic cars show up in the rocks all along the coastline."

—HARLEY JESSUP

Armand Baltazar, Digital, 2010.

Armand Baltazar, Digital, 2009.

Armand Baltazar, Digital, 2009.

Armand Baltazar, Digital, 2010.
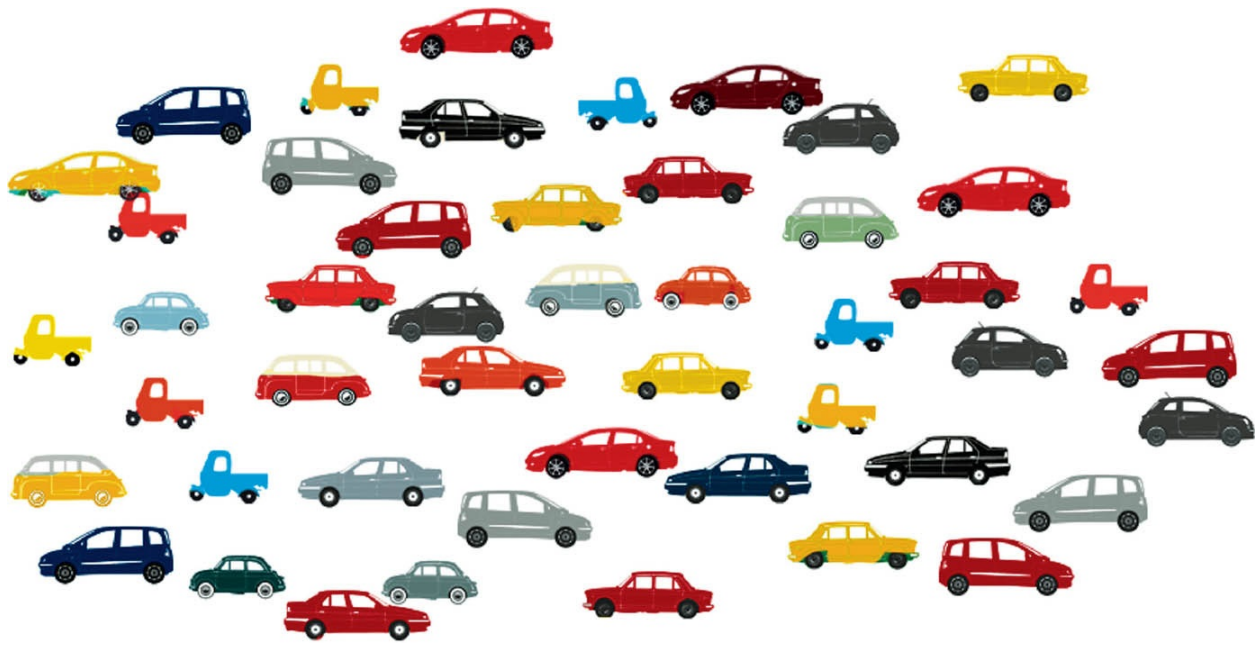
Color Palette for Italian Background Cars, **Bert Berry**, Digital, 2010.

PORTO CORSA CASINO

Harley Jessup, Pencil/Digital, 2010.

"The huge interior of the Porto Corsa Casino is based on vintage photographs of Monaco's Casino de Monte Carlo. There are murals and statues of Roman gods and cherubs all depicted as cars. The main gambling room has slot machines shaped like gas pumps."

—HARLEY JESSUP
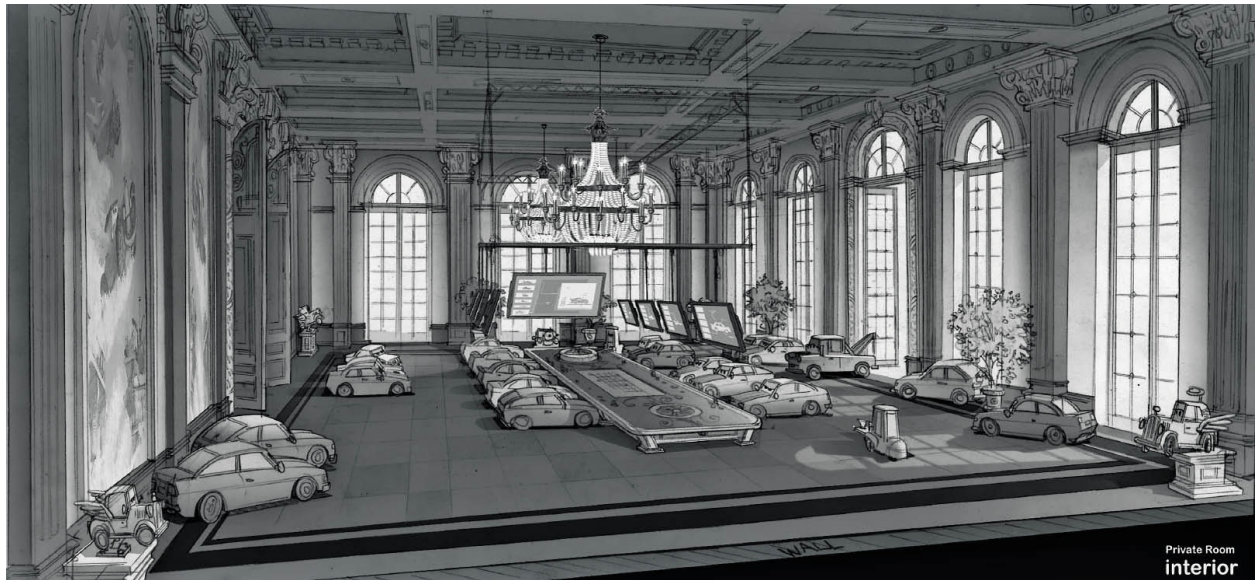
Kristian Norelius, Pencil/Digital, 2010.

Casino Mural, **Randy Berrett**, Digital, 2010.

Storyboard, **Kevin O'Brien**, Digital, 2010.

UNCLE TOPOLINO'S VILLAGE

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

MASERATI FOUNTAIN

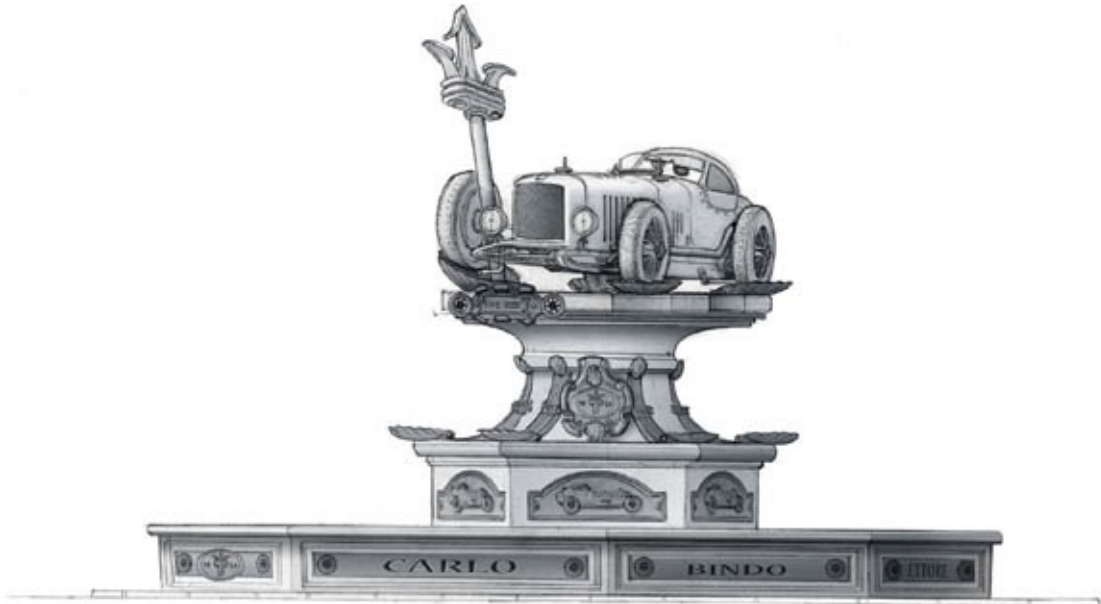**Kristian Norelius**, Pencil/Digital, 2009.
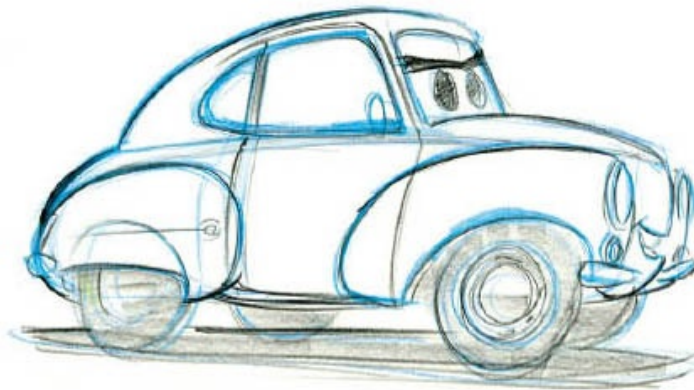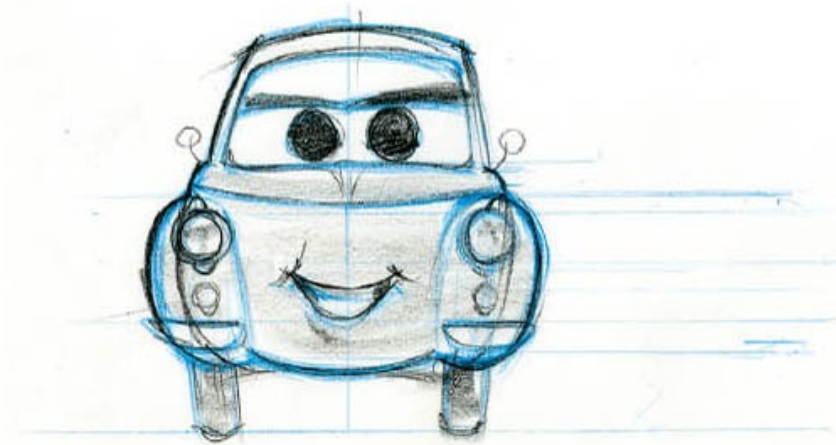
Bob Pauley, Pencil, 2010.

Grant Alexander, Digital, 2010.

Kristian Norelius, Pencil/Digital, 2009.

"Uncle Topolino's village was inspired by a place we visited in Italy that has this little brewery Brad [Lewis]

loves. It's just this little town in the hills, surrounded by vineyards, with a little plaza and a fountain in the middle —really cute and quaint. We show it in the film in this beautiful twilight setting with little twinkle lights, so it just feels as romantic as we can possibly make it."

—SHARON CALAHAN

MAMA BERNOULLI

Josh Cooley, Pencil, 2010.
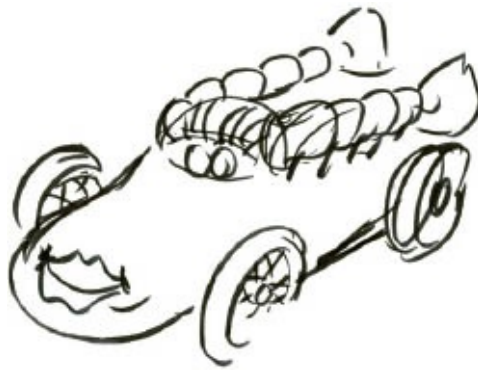
John Lasseter, Ink, 2010.
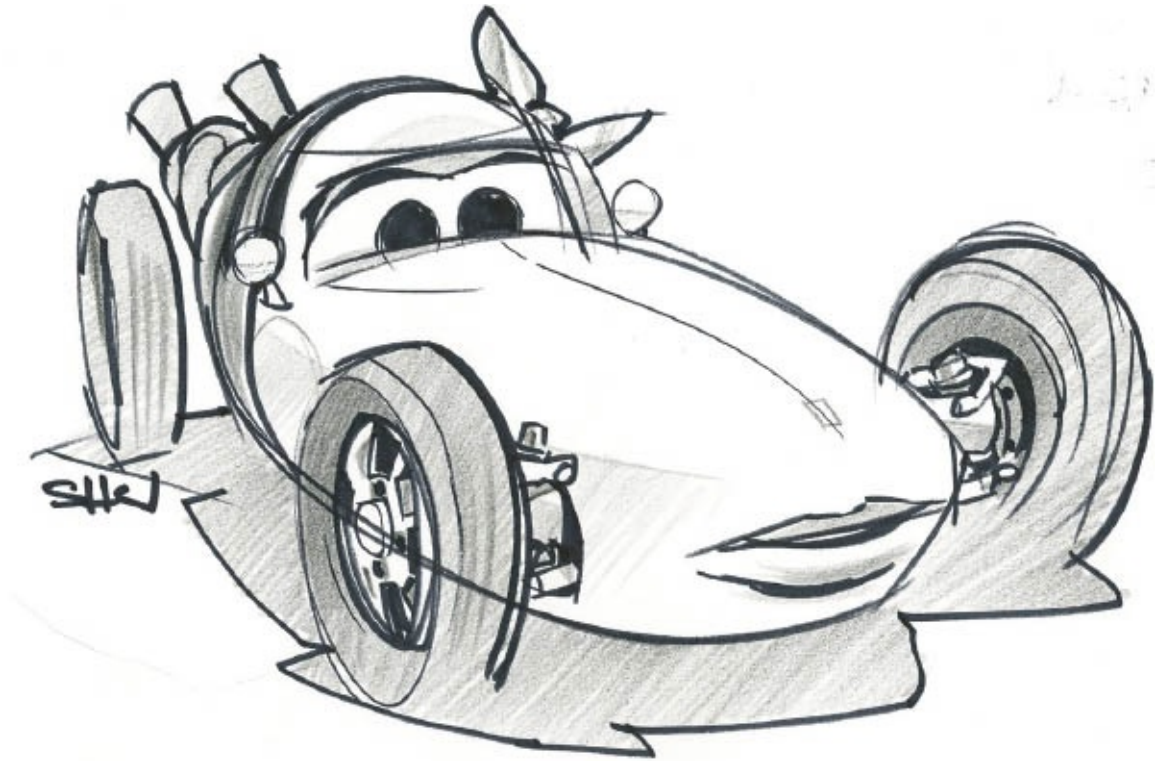
Jay Shuster, Ink, 2010.

Badge and Scarf Graphics, **Cassandra Smolcic**, Digital, 2010.
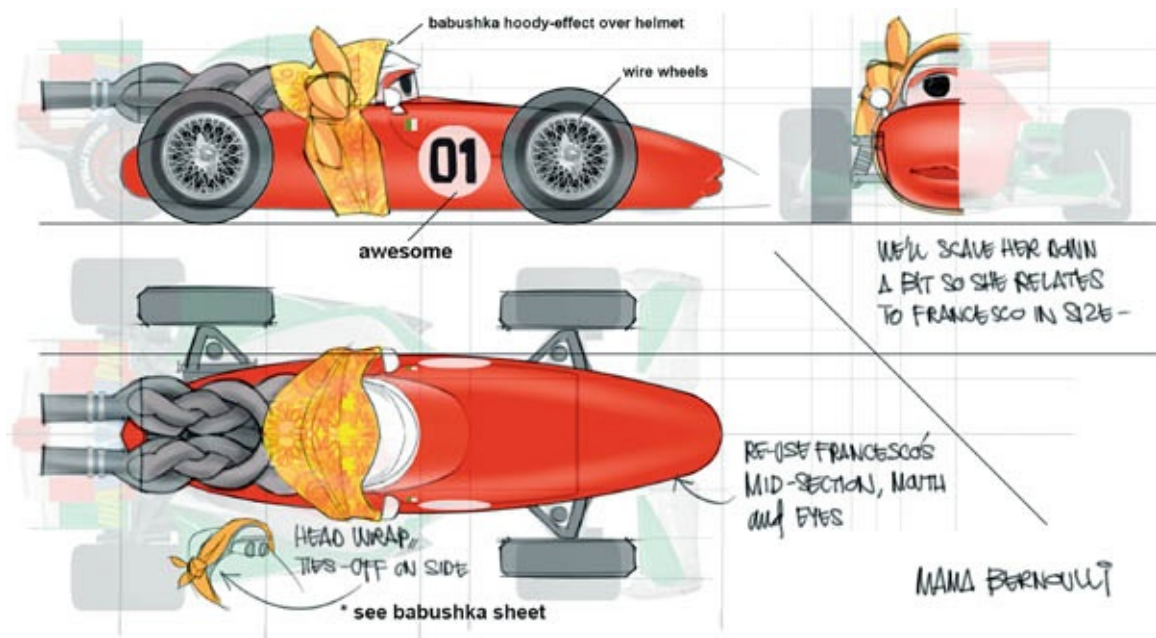
Model Packet, **Jay Shuster**, Digital, 2010.

PIAGGIO SERVICE VEHICLE
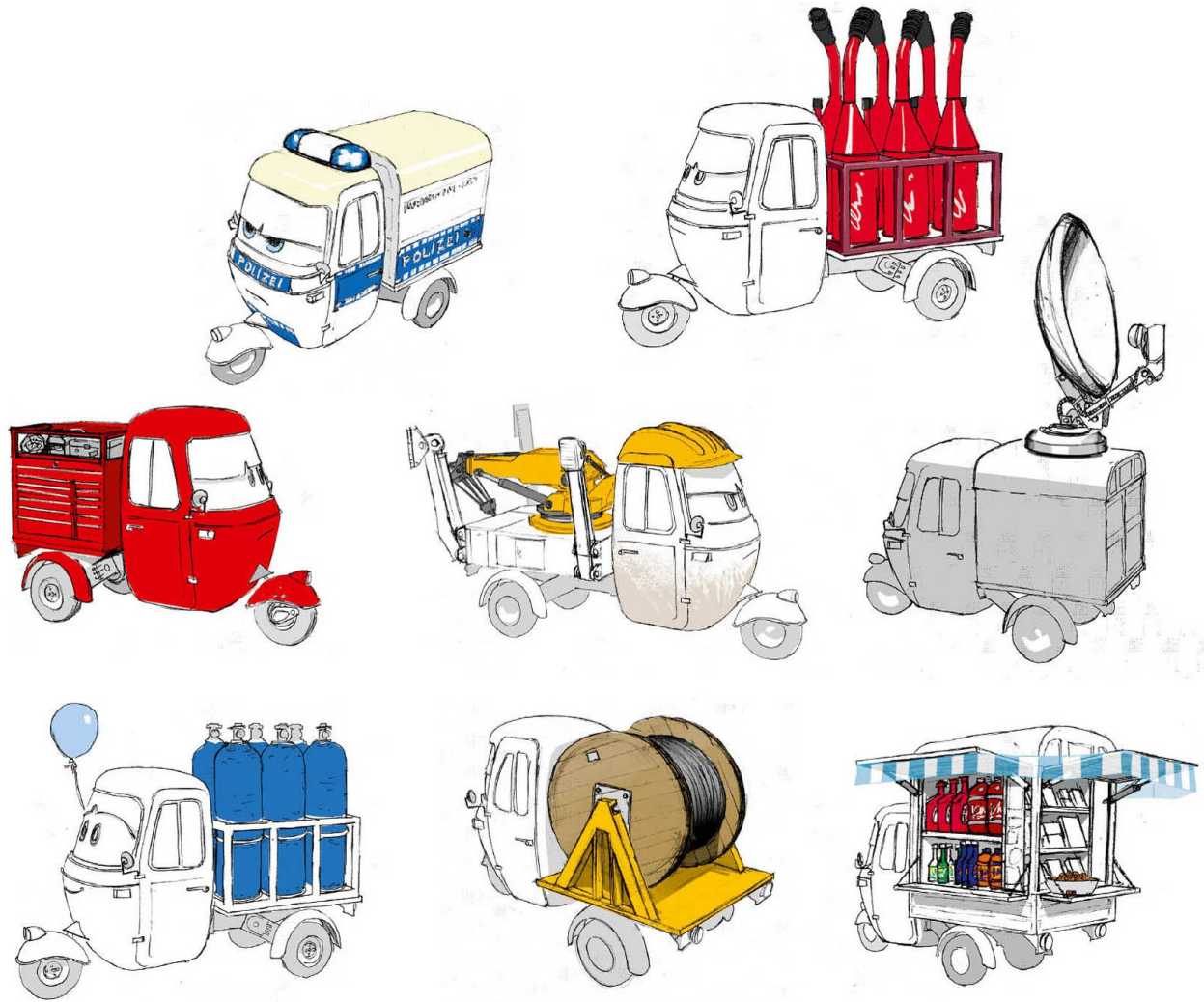
Willy Hwang, Pencil/Digital, 2010.

THE LEMONS

The bad guys of the Cars world, The Lemons, are socially shunned "loser" cars: automotive anomalies like three-wheeled cars; the German Zündapp Janus, which looks the same from the front and back; and the AMC Pacer and Gremlin.

Grant Alexander, Pencil/Digital, 2008.

"In looking for great bad-guy thug cars, it dawned on me: what better reason is there to have a bad attitude and chip on your shoulder than the world making fun of the way you look, calling you a 'lemon' . . . Especially when that ridicule ultimately results in you no longer being manufactured."

— BRAD LEWIS

Storyboard, **Josh Cooley**, Digital, 2010.

PROFESSOR ZÜNDAPP
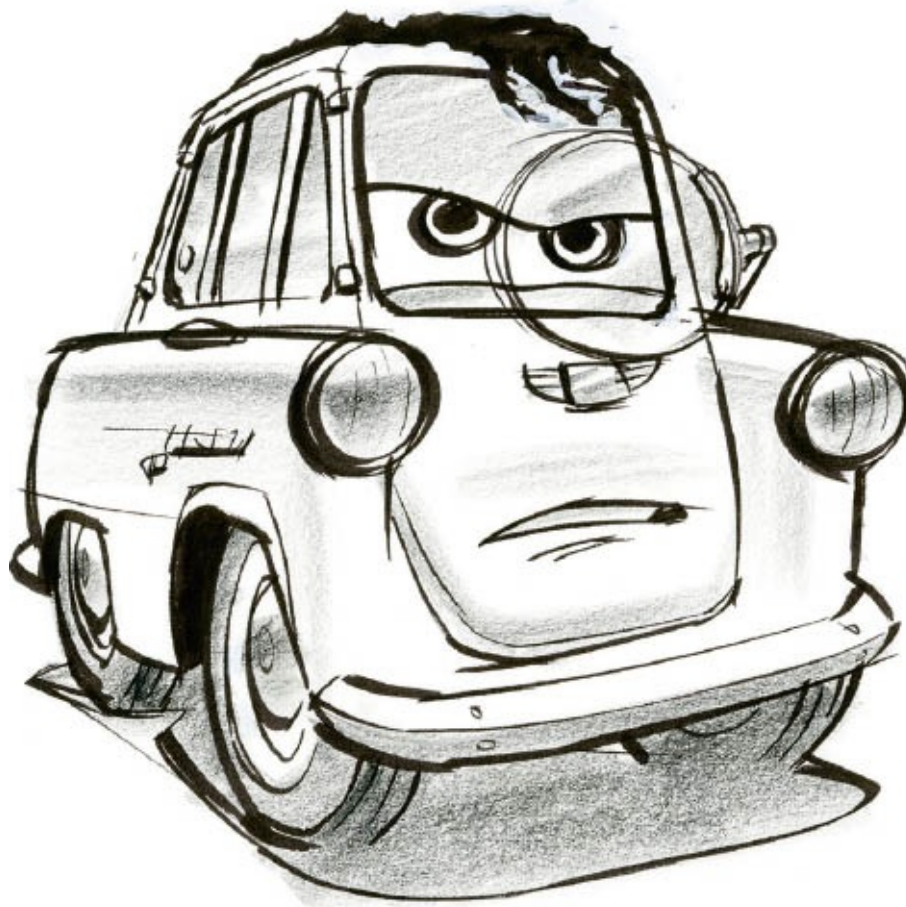
Grant Alexander, Pencil/Marker, 2010.
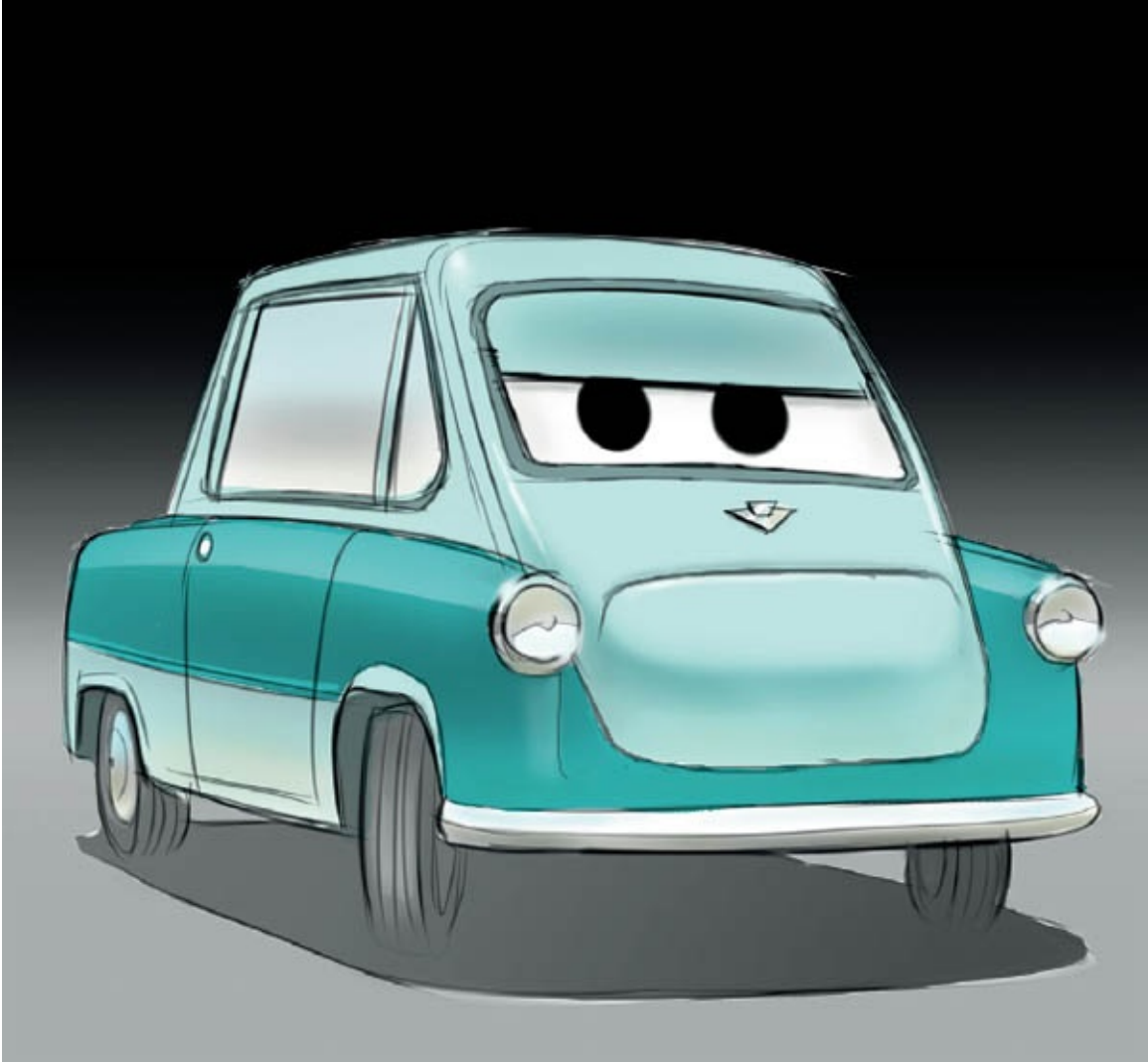
Grant Alexander, Pencil/Digital, 2009.

Jack Chang, Digital, 2010.

"Zündapp's this guy you love to hate. He's just such a creep, so smarmy and full of himself. And I love his individual Chiclet teeth. No matter how creepy and mean and weird this guy is going to be, he's still got those goofy little teeth."

—DAVE MULLINS

GREM

John Lee, Pencil/Digital, 2009.

Storyboard, **Kevin O'Brien**, Digital, 2010.

HUGO

Grant Alexander, Digital, 2009.

Ellen Moon Lee, Digital, 2009.

Jack Chang, Pencil/Digital, 2009.

ACER

"I've become obsessed with the Pacers and the Gremlins, studying all the models and the original colors that they came out in. They all had these amazing names like 'Renegade Plum' and 'Jetset Blue.'"

—BERT BERRY

Jack Chang, Digital, 2009.

Jack Chang, Pencil/Digital, 2009.

TRUNKOV

Jack Chang, Pencil/Digital, 2009.

ROADS NOT TAKEN

Armand Baltazar, Layout by **Harley Jessup**, Digital, 2008.

Dan Holland, Pen/Marker, 2010.

The following pages show a mere fraction of the amazing work that didn't make it into the final movie. When the story was overhauled in early 2010, whole sequences fell away: a Calais port, the nighttime

streets of Prague, an off-road Oktoberfest-themed rally in Germany's Black Forest, and a glitzy gala in Munich that was later relocated to Tokyo. Characters disappeared as well: an Alfa Romeo–inspired double agent named Giulia, and a mysterious failed race car named Zil—the film's original villain.

Based on an actual 1950s race car manufactured by Z.I.L. (Zavod Imeni Likhachova), a Russian automotive company best known for its armored transport vehicles, the Soviet-era car was intended to challenge the top race cars of the day. Instead, it turned out to be a high-profile dud, its top speed a mere 85 miles per hour. Zil the character had a coterie of comparably bad (mechanically and otherwise) cars to do his dirty work. Though this character was ultimately put aside in favor of another evildoer, his sidekicks were kept on as the Lemons.

"It's interesting how early ideas that are good will find their way back into the story and actually serve to solve a new problem," says Jessup. "It's a phenomenon that happens many times on every Pixar film; it's like the idea's time has finally come. For example, we visited the incredible National Art Center Museum in Tokyo—an amazing glass and concrete structure—but at that point the museum scene, set in Munich, had been cut. As soon as we heard the museum party was back in, now set in Tokyo, we knew we had the perfect place for it."

GIULIA

Sculpt, **Jerome Ranft**, Clay, 2009.

Jay Shuster, Digital over sculpt by **Jerome Ranft**, 2009.

"In one of the earlier incarnations of the movie, we had a character named Giulia who was basically a double agent; she connected with Mater, the two of them went off and had their own adventures, and then met up again with the other characters at the end."

—NATE STANTON
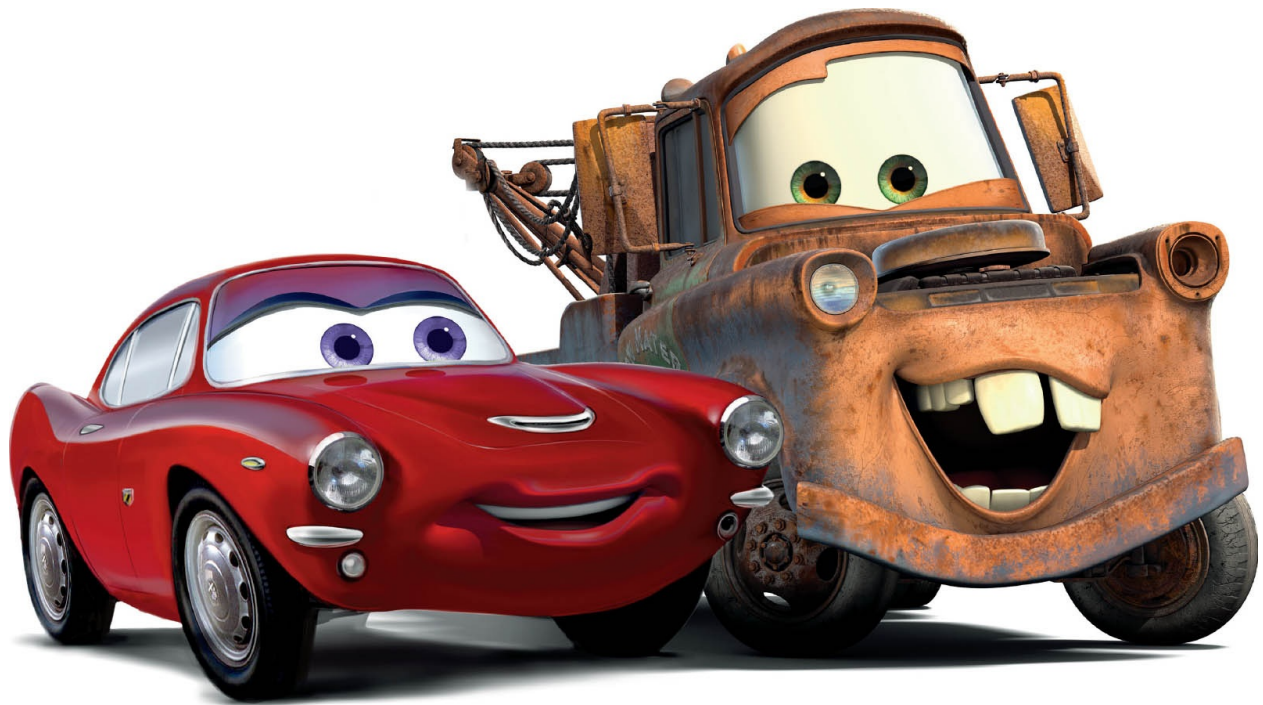
Jay Shuster, Digital, 2009.

ZIL

Armand Baltazar, layout by **Jay Shuster**, Digital, 2008.

Armand Baltazar, Layout by **Harley Jessup**, **Philip Metschan** and **Jay Shuster**, Digital, 2008.

Sculpts, **Jerome Ranft**, Clay, 2009.

CALAIS PORT

"At one point we had a scene that was to take place at a huge port in Calais. A lot of that environment would just look like functional machinery to humans. But in the Cars world, it was an enormous international marketplace with a great New York–like vibe. Cargo ships, sailboats, yachts, trucks, trains, cranes—it was a teeming and energized environment, with everything in transport from one place to another."

—BRAD LEWIS

John Lee, Pencil/Digital, 2009.

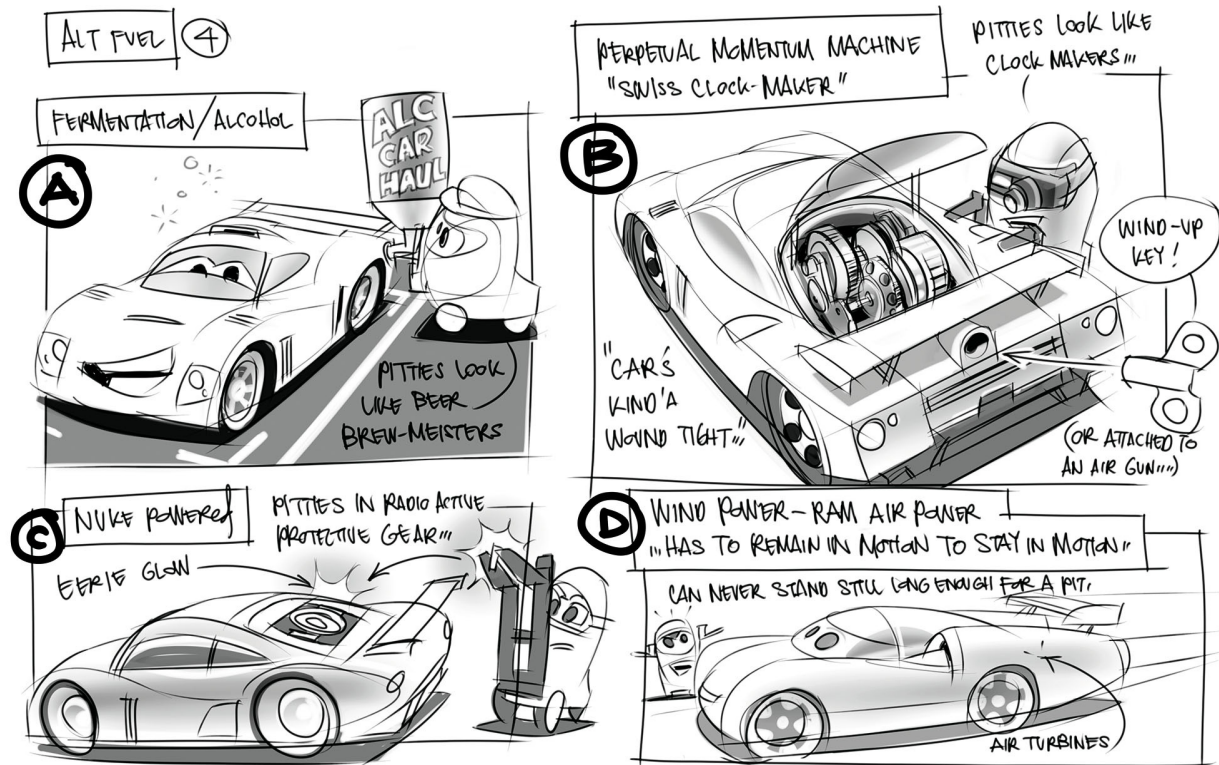**Armand Baltazar**, Pencil/Digital, 2009.
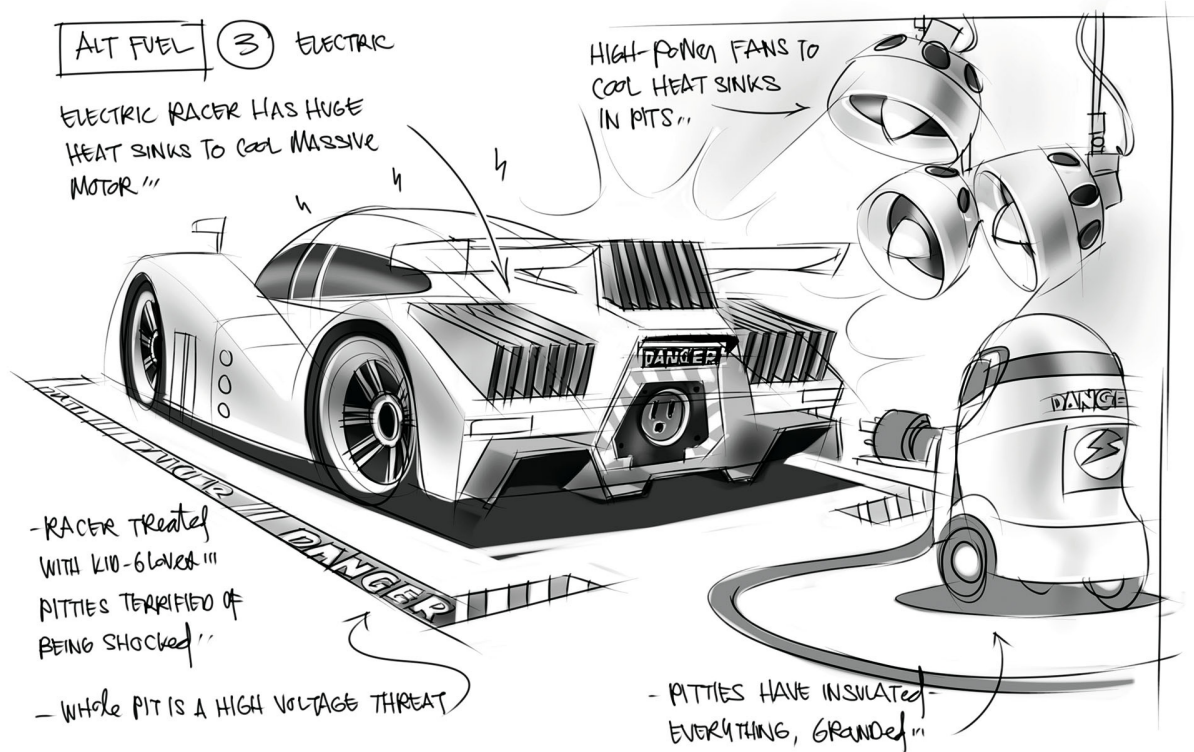
Armand Baltazar, Pencil/Digital, 2009.

Harley Jessup, Digital, 2009.

ALTERNATIVE FUEL CONCEPTS

Jay Shuster, Pencil/Digital, 2009.

The sketch contains the following handwritten annotations:

ALT FUEL ③ ELECTRIC

ELECTRIC RACER HAS HUGE HEAT SINKS TO COOL MASSIVE MOTOR'''

HIGH-POWER FANS TO COOL HEAT SINKS IN PITS''

DANGER

-RACER TREATED WITH KID-GLOVER''' PITTIES TERRIFIED OF BEING SHOCKED''

— WHOLE PIT IS A HIGH VOLTAGE THREAT

- PITTIES HAVE INSULATED EVERYTHING, GROUNDED'''

Jay Shuster, Pencil/Digital, 2009.

"Early on we were going to have multiple alternative fuels that each of the race cars would be driving on. There were all sorts of crazy ideas—cars running on bananas, algae, coffee, helium, solar power, even wine. I always chuckle at the idea of little pittie cars crushing grapes in a giant barrel in the pit area of each race."
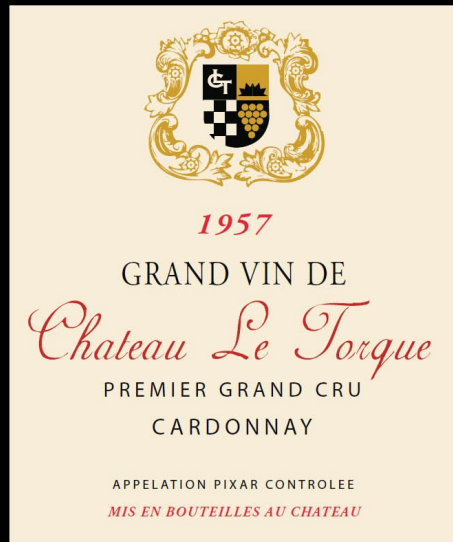
—NATE STANTON

Josh Cooley, Ink, 2009.

Jay Shuster, Pencil/Digital, 2009.

John Lee, Digital, 2009.

Graphics, **Ellen Moon Lee, Marty Baumann, Cassandra Smolcic**, Digital, 2009.

GERMANY'S BLACK FOREST

John Nevarez, Digital, 2009.

John Lee, Digital, 2009.

"We were going to have an off-road race in Germany, which I think would have been really cool; it was going to be the most unique of our races. I do regret that we missed out on that. But within the story structure you saw so little of that race; I can understand why it fell off to the wayside."

to the wayside.

—*NATE STANTON*

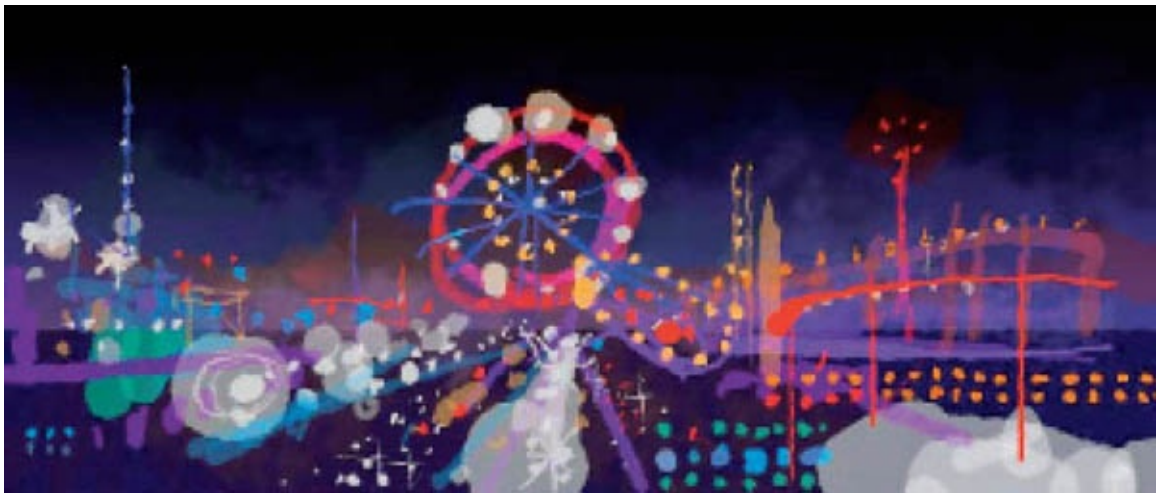

Nat McLaughlin, Pencil/Digital, 2008.

Harley Jessup, Digital, 2009.

Armand Baltazar, Layout by **Harley Jessup** and **Jay Shuster**, Digital, 2008.
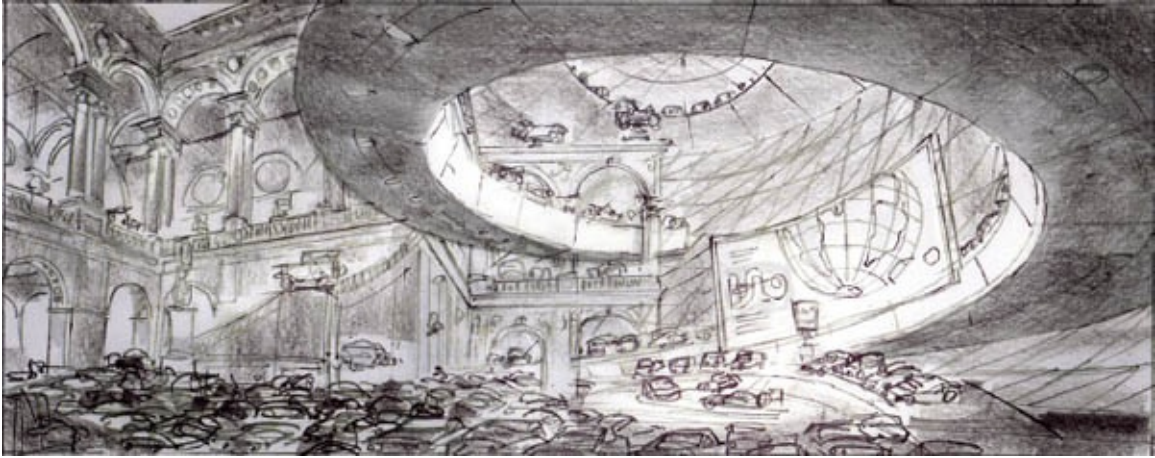
MUNICH MUSEUM

Armand Baltazar, Layout by **Philip Metschan** and **Jay Shuster**, Digital, 2008.

Nat McLaughlin, Pencil/Digital, 2009.

Harley Jessup, Pencil, 2009.
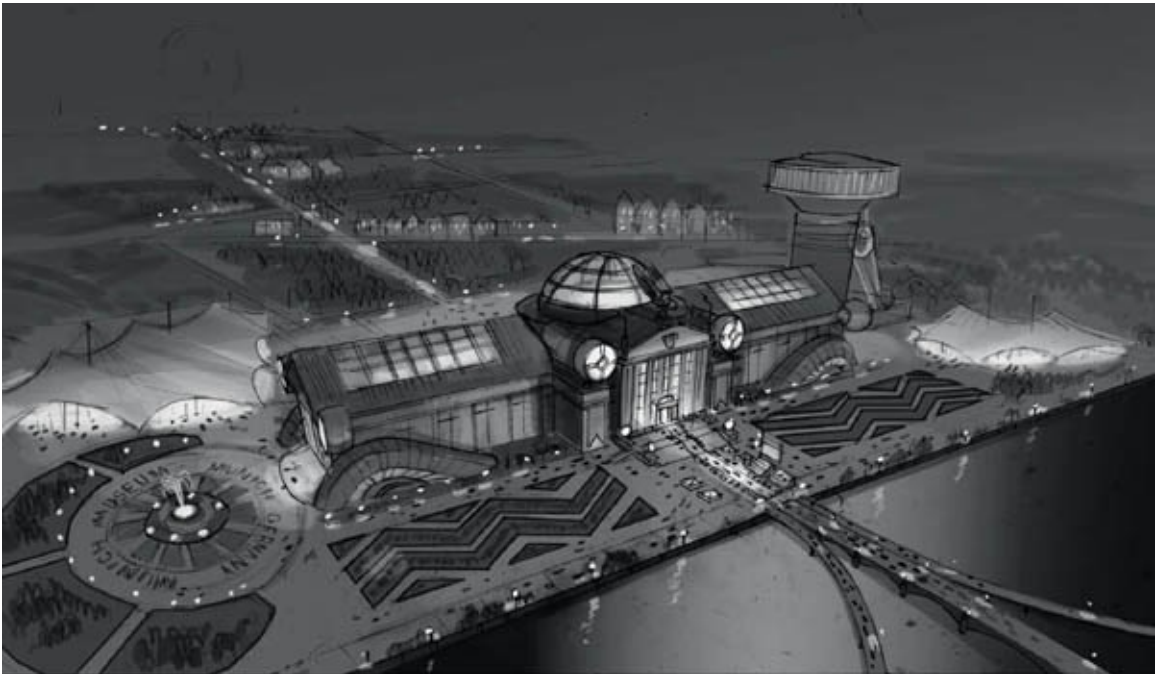
Nat McLaughlin, Pencil/Digital, 2009.

PRAGUE

Armand Baltazar, Digital, 2008.

"In an early version of the story, a British agent was captured in a scrap yard on the outskirts of Prague and questioned while being slowly squashed in the jaws of a car crusher. The junkyard at night was a great spooky setting and parts of this idea show up in the Tokyo Lemons' Lair sequence."

—HARLEY JESSUP

Storyboards, **Nate Stanton, Bobby Rubio**, Digital, 2009.

LONDON

Armand Baltazar, Digital, 2010.

John Lee, Digital, 2010.

The London climax of *Cars 2* includes a clockwork death trap, a gun battle by the Thames, chases through the city's streets, and a final confrontation at Buckingham Palace. The challenge for the art and technical departments: creating a setting for all this action that actually represents over twenty square miles of London and literally thousands of uniquely car-styled period buildings. "It was exciting and a little scary to plan the London city set," says Harley Jessup. "We're not only racing

through the city, but we're flying above it. When the chase breaks out of the race course, the whole city of London becomes the stage for this epic battle."

Yet even with a boiled-down approach to designing London, the eclectic nature of the city's urban landscape proved challenging. "London was the toughest set for us to create," says Jessup. "We had to design miles of complex city streets showing a huge variety of architectural styles. There are antique Georgian, Victorian, Queen Anne, and Edwardian style buildings that all have been given a Cars-world twist."

Much like the opening action on the oil platform, when this final sequence was conceived, the filmmakers knew it was strong enough to withstand the numerous subsequent script changes. Says Lasseter, "A voice-activated bomb is planted on Mater, and it can only be deactivated by the person who set it. When Mater accuses the benevolent philanthropist who's sponsoring the race of being the bad guy, everybody thinks he's completely off his rocker. But just as it's about to count down to zero, the bad guy says, 'deactivate,' and the bomb is defused. Right then and there, Mater goes from seeming like a complete idiot to being one of the most brilliant guys on the planet. That moment became a stake in the ground as soon as we got it—we immediately went back to the beginning of the movie to make sure everything in the film was working to set that up."

Also, much like the spy opening, London's Big Bentley sequence brought the art and story departments together. "Nick [Sung] was boarding it, and art was doing SketchUp models at the same time," says story manager Kate Ranson-Walsh. "Production-wise, we were constantly bringing boards over to story from the art department. We were just so on top of each other on this movie."

The art department worked on multiple scale levels. There was a team designing the car-themed London skyline showing a car-ified take on Westminster Cathedral, the London Eye, St. Paul's, the Houses of Parliament, and dozens of other famous landmarks, while Nat McLaughlin focused on Buckingham Palace, the race pit buildings, and Big Bentley. Jay Shuster and the character team created designs for the

most classic British car characters, including London double-decker buses, taxis, Range Rovers, Jaguars, and Minis. The graphics group worked on the hundreds of street level advertising and traffic signs while the art interns were working on street props like phone booths, lamp posts, and mailboxes.

Jessup believes that the crew's collaboration is the key to creative success: "We wanted *Cars 2* to be as richly layered as the first film, but capturing the variety of architectural styles and detail over miles of London streets has been a big challenge. To solve the problem, we needed everyone to put their heads together and offer their best ideas." Denise Ream agrees: "The dedication to authenticity has been terrific. We've talked to real auto manufacturers, real racecar drivers, even real spies!"

Shader Packet, **Bryn Imagire**, Digital over Model Packet, **Nat McLaughlin**, Digital, 2010.

Storyboard, **Nick Sung**, Digital, 2010.

Storyboard, **Derek Thompson**, Digital, 2010.

"In London, we decided to go for overcast skies. It's a look we aren't using anywhere else in the film, and since we'll have just come from the sunny Riviera, you want to have a big enough change to feel like you're somewhere new. Plus, even on an overcast day, London is just absolutely beautiful. There's something about it that just looks good with overcast white light."

—SHARON CALAHAN
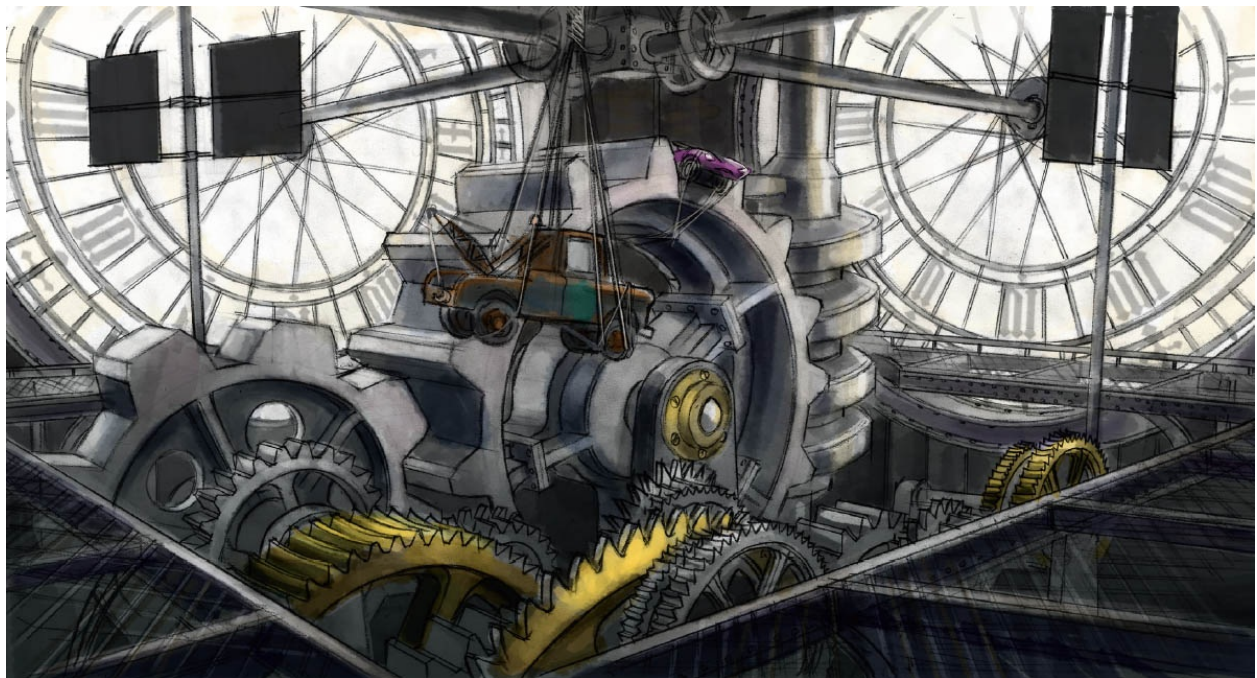
Nat McLaughlin, Pencil/Digital, 2010.

LONDON STYLE

"In London the characters break out of the race track and charge into rush hour traffic. It gave us an opportunity to show crowds of red double-decker buses and black taxis, all as British characters. The color red kept coming up in our palette for London. Besides the buses, the uniforms of the royal guard, the telephone booths and mailboxes and even the Union Jack all add bright bursts of red to the cool gray palette of the city."

—HARLEY JESSUP

Harley Jessup, Photographs, 2009. top middle: The Queen and The Duke of Edinburgh arrive on the West Terrace of Buckingham Palace to attend a Garden Party © Buckingham Palace Press Office.

Paul Topolos, Layout by **Harley Jessup**, Digital, 2010.

"Designing the different environments for the film was a long process of refinement. We started very broad, keeping things rough at first and then working with the story department to figure out exactly what needed to be designed and built. We knew, though, that there were certain things each city just had to have—in London, the classic red British phone booths, the elaborate gambrel roofs, landmarks like Tower Bridge— all those accents that give a place its characteristic flavor."

—NAT McLAUGHLIN

Model Packet, **Armand Baltazar**, Pencil/Digital, 2010.

Harley Jessup, Digital, 2010.
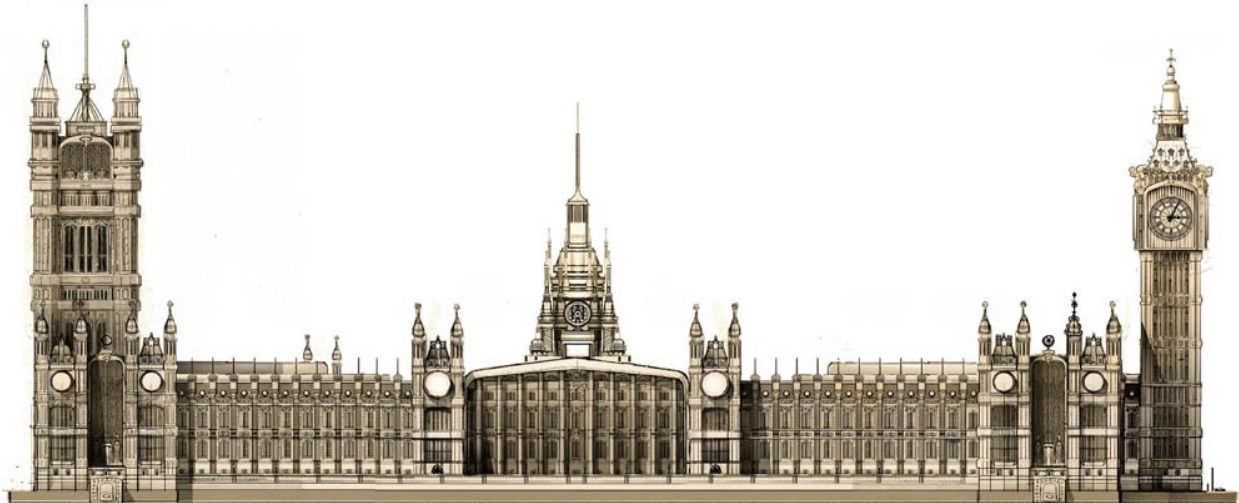
Dan Holland, Marker/Digital, 2009.

"One of my favorite character designs in the film is Dan Holland's London bus. A classic London bus has an asymmetrical cab, with a window that pushes out farther on one side than the other. Dan's solution was so clever —he turned that leading-edge window into a monocle, adding this great grille mustache to make the bus into a dignified British gentleman."

—*JOHN LASSETER*

London Street Prop Model Packet, **Alejandro Leon**, Digital, 2009.
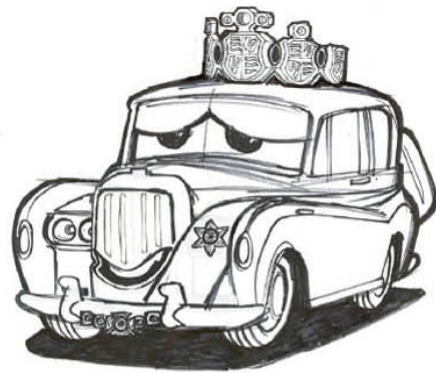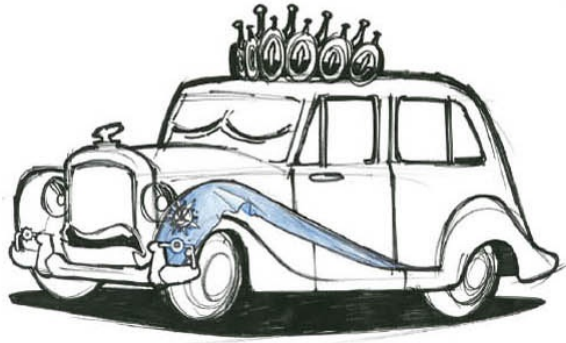
PARLIAMENT

Model Packet, **Tim Evatt**, Digital, 2010.

Model Packet, **Harley Jessup**, Pencil/Digital, 2010.

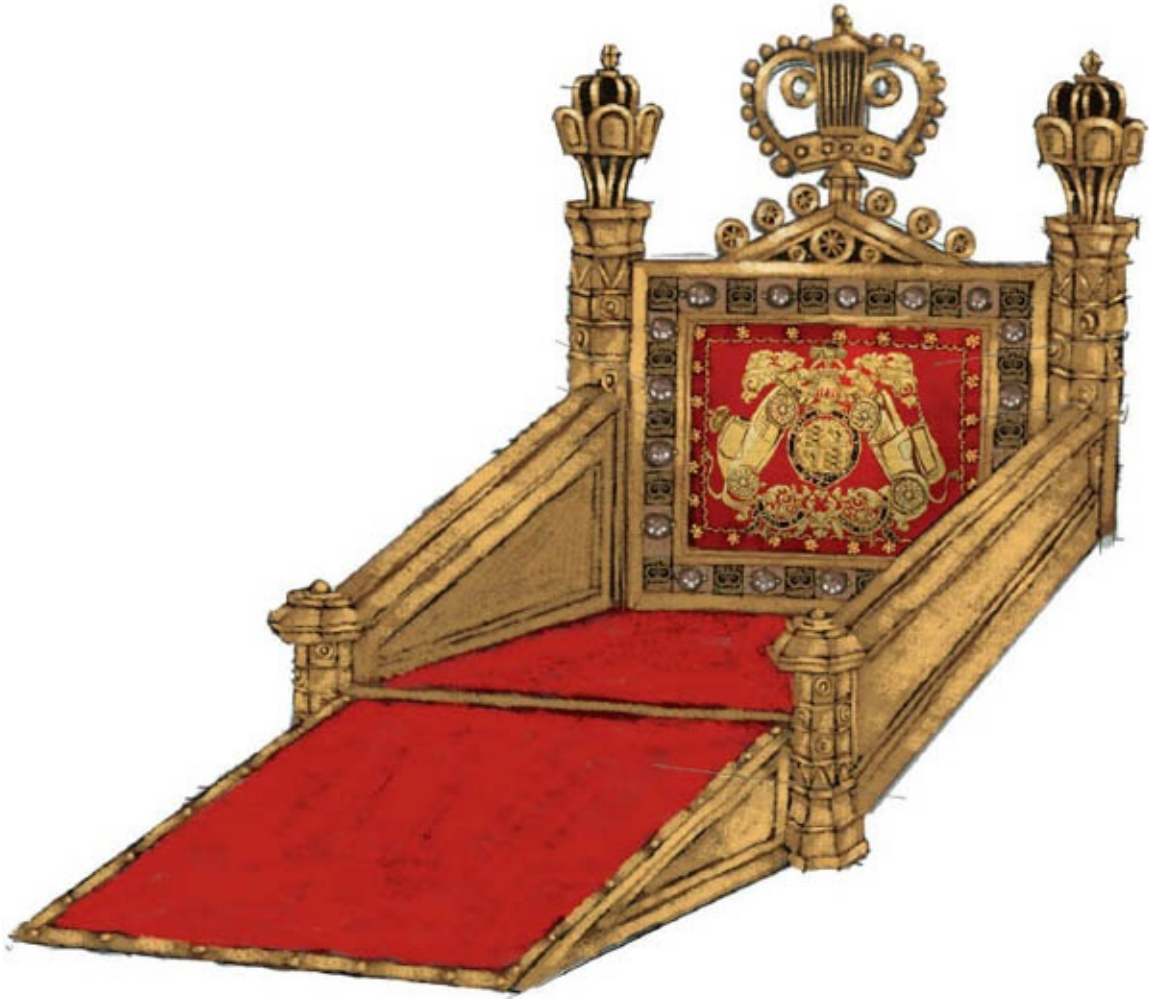**Dan Holland**, Pencil, 2010.

Jay Shuster, Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Queen's Emblem, **John Lee**, Digital, 2010.

Shader Packet, **Bryn Imagire**, Digital over Model Packet, **Nat McLaughlin**, Digital, 2010.

Storyboards, **Erik Benson, Josh Cooley, Brian Fee, Scott Morse, Bill Presing, Tony Rosenast, Alex Woo**, Digital, 2010.

Kristian Norelius, Pencil/Digital, 2010.

Nat McLaughlin, Pencil/Digital, 2010.

Harley Jessup, Digital, 2010.

"Each designer put their own stamp on the stylization of the London landmarks. We tried to be respectful of the rules of classical architecture as we were weaving automotive shapes into the facades of the buildings. It's fun that, at second glance, you might notice that the dome of St. Paul's is actually a differential gear case."

—HARLEY JESSUP

St. Paul's Cathedral - London

Garrett Taylor, Digital, 2010.
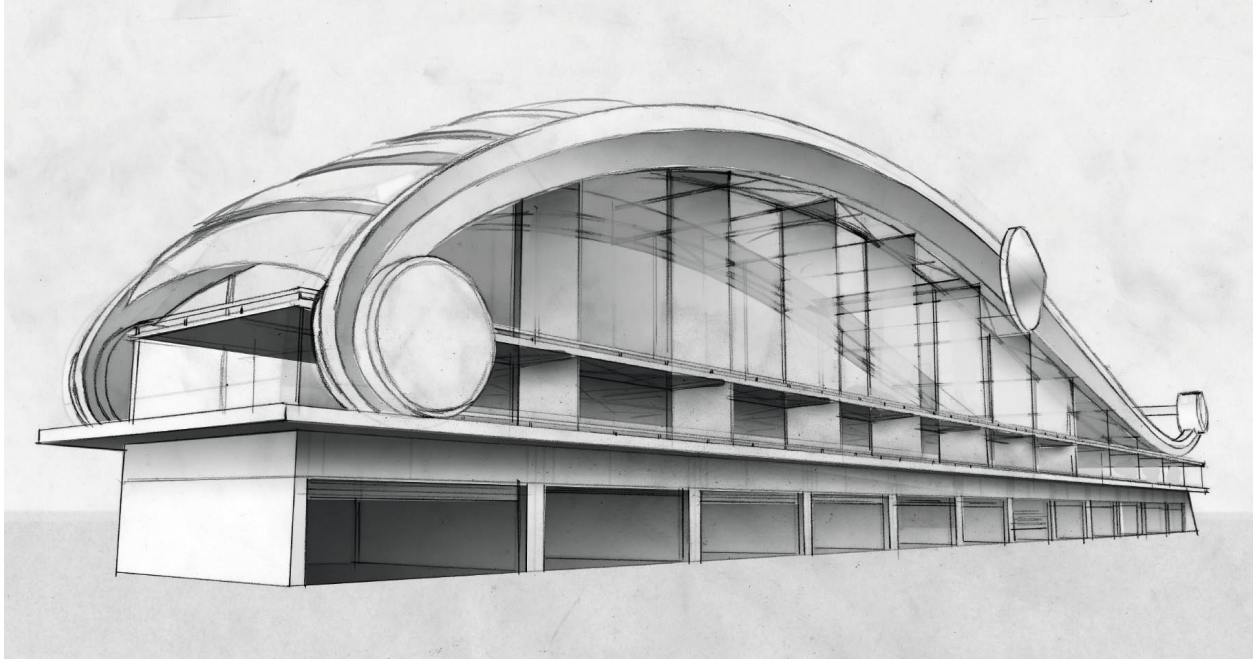
BUCKINGHAM PALACE

Nat McLaughlin, Digital, 2010.

Model Packet, **Nat McLaughlin**, Pencil/Digital, 2010.

London Race Pits, **Nat McLaughlin**, Pencil/Digital, 2009.

"We were originally going to have a twenty-four-hour race in Paris, and the track had these really cool pit buildings. We liked them so much that when the story evolved and we ended up cutting the Paris race, we just took that design and used it in London."

—JOHN LASSETER

Nat McLaughlin, Digital, 2009.

Knighting Room Mural, **Jason Merck**, Digital, 2010.

Knighting Room Mural, **Jason Merck**, Digital, 2010.

Knighting Room Mural, **Jason Merck**, Digital, 2010.

MILES AXLEROD

Jay Shuster, Color by **Bill Zahn**, Digital, 2010.

"For me, the best bad guys are the ones where you understand why they're doing what they're doing—you see their logic. You don't have to agree with it, of course, but you understand it. Otherwise, they're just a generic villain doing evil for evil's sake."

—JOHN LASSETER

Jay Shuster, Digital, 2010.

Storyboard, **Tony Rosenast**, Digital, 2010.

Jay Shuster, Digital, 2009.

Jay Shuster, **Ellen Moon Lee**, Digital, 2010.
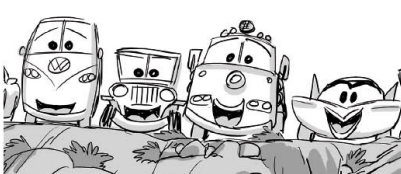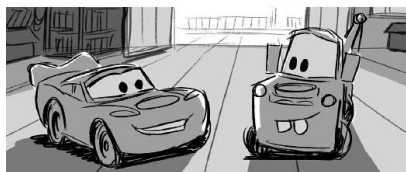

Jay Shuster, **Ellen Moon Lee**, Digital, 2010.

RADIATOR SPRINGS

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Storyboards, **Brian Fee, Josh Cooley, Tony Rosenast, Bill Presing**, Digital, 2010.

Just as the arrival of the interstate literally took Radiator Springs off the map, the arrival of Lightning McQueen announced its return to its former

glory. The art and story departments, similarly, had to reenvision the "cutest little town in Carburetor County" as a rediscovered tourist stop. And with such time and attention paid to expanding the Cars world, Mater and McQueen's hometown needed to be a warm, comforting home base that the story could launch itself from and return to at the end.

"It's been five years since we were in Radiator Springs, and I think the audience will be looking forward to revisiting the place that they loved. We want to show the town in a slightly new light," says Jessup. "Sharon's [Calahan] lighting design shows a warmly colored, welcoming version of Radiator Springs that feels just like seeing an old friend."

But despite striving for this fuzzy familiarity, the reality of the town's newfound fame (the result of being the hometown of a famous race car) must be reflected in a new look. "The town is a lot more affluent than it was when we left it," says Calahan. "So there's a lot more activity there. People are busy and doing things and expanding. The last time we were there, it was a pretty sleepy little place; now it's a tourist mecca."

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"The question of who comes along on the trip with McQueen took a long time to figure out, but the story team landed in this really beautiful place with the idea that everybody gets to go with their best friend. Luigi gets to bring Guido, Sarge and Fillmore get to go together, and then of course there's Mater and McQueen."
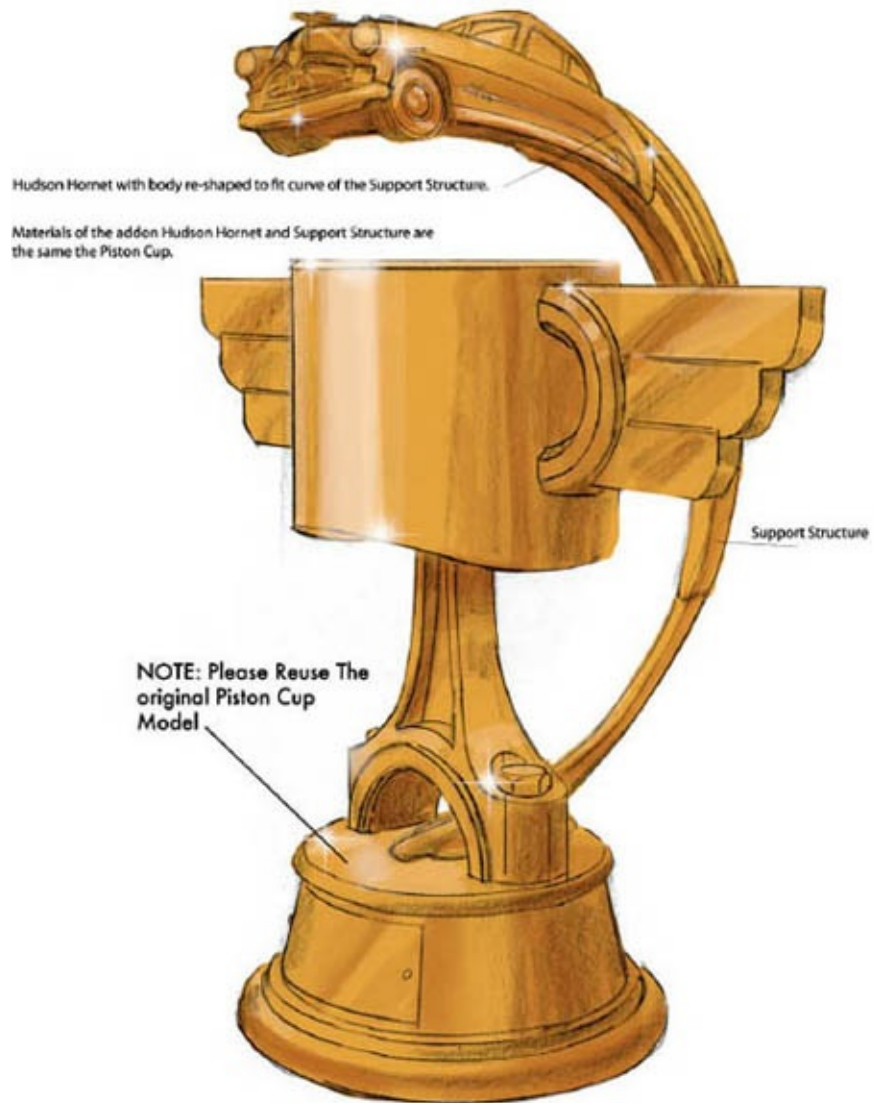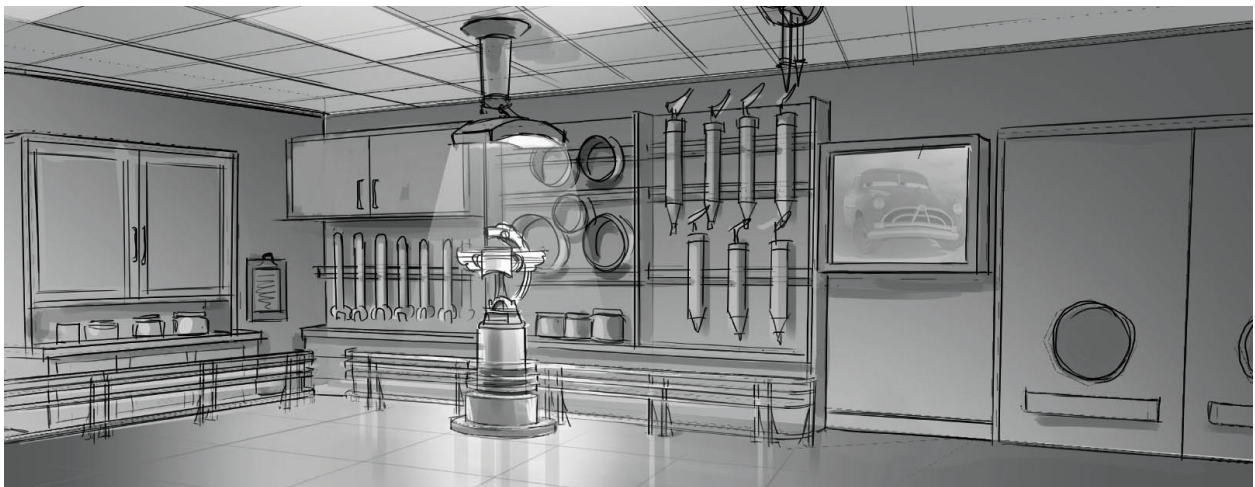
Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Storyboard, **Enrico Casarosa**, Digital, 2009.

Hudson Hornet with body re-shaped to fit curve of the Support Structure.

Materials of the addon Hudson Hornet and Support Structure are the same the Piston Cup.

Support Structure

NOTE: Please Reuse The original Piston Cup Model

Model Packet, **Randy Berrett**, Pencil/Digital, 2010.

Nat McLaughlin, Pencil/Digital, 2009.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

"The look of *Cars 2* owes a huge debt to the brilliant designs that production designers Bob Pauley and Bill Cone did for the first film. With John Lasseter and Joe Ranft, they developed the logic of a world where cars are living characters. It's been a privilege to get to apply those ideas around the world in *Cars 2*."

—HARLEY JESSUP

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Storyboard, **Nate Stanton**, Pencil/Digital, 2008.

Jack Chang, Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

EPILOGUE

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

Tonally, the mélange of styles, characters, and influences in *Cars 2* all seems to work beautifully together, like the components of a high-performance engine. Dave Mullins: "*Cars 2* is the *Cars* world at its most mature, where we're able to balance all this fun, light action with appealing characters that you care about. So there's action that gets you pumped up on the edge of your seat, and then these tender moments between all the characters that we love."

At the end of the day, this tonal high-wire act is successful due, in large part, to the consistent (and consistently eye-popping) visuals. John Lasseter: "Looking at these beautiful pieces of art as the story is developing inspires you to dig deeper and find really great moments and scenes that will take full advantage of what you're seeing. I just love how collaborative the process of animation is here at Pixar, and getting to work with such brilliant people is something I really cherish."

John Nevarez, Digital, 2010.

Lighting Study, **Sharon Calahan**, Digital paint over set render, 2010.

ACKNOWLEDGMENTS

Harley Jessup, Digital, 2010.

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JOHN LASSETER is a two-time Academy Award–winning director and the chief creative officer at Pixar and Walt Disney Animation Studios.
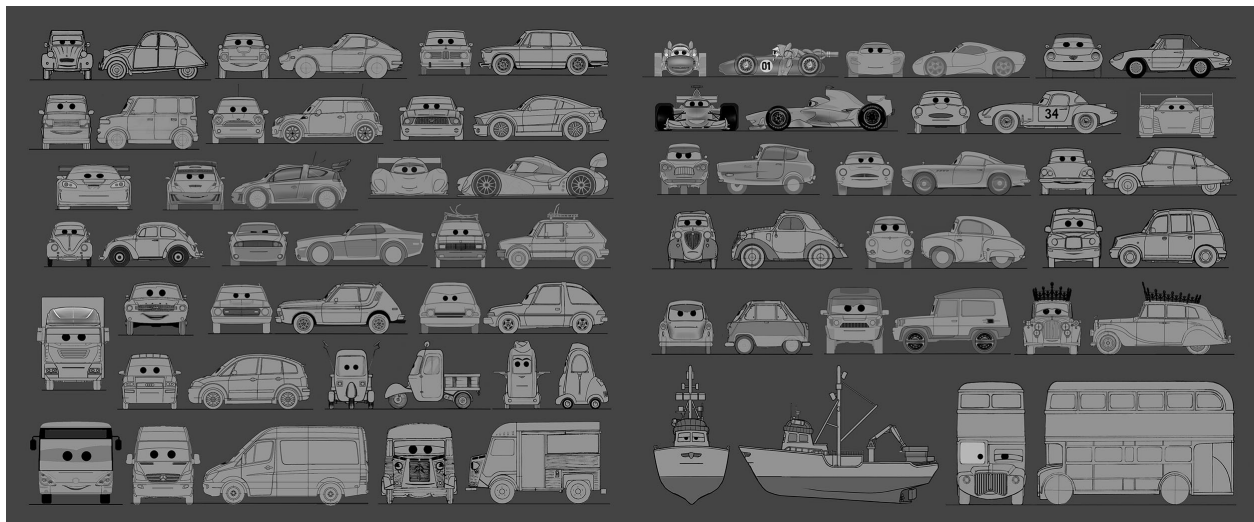
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